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JANUARY 1988

VOLUME 6
NUMBER 1

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THE NEW TAX LAW

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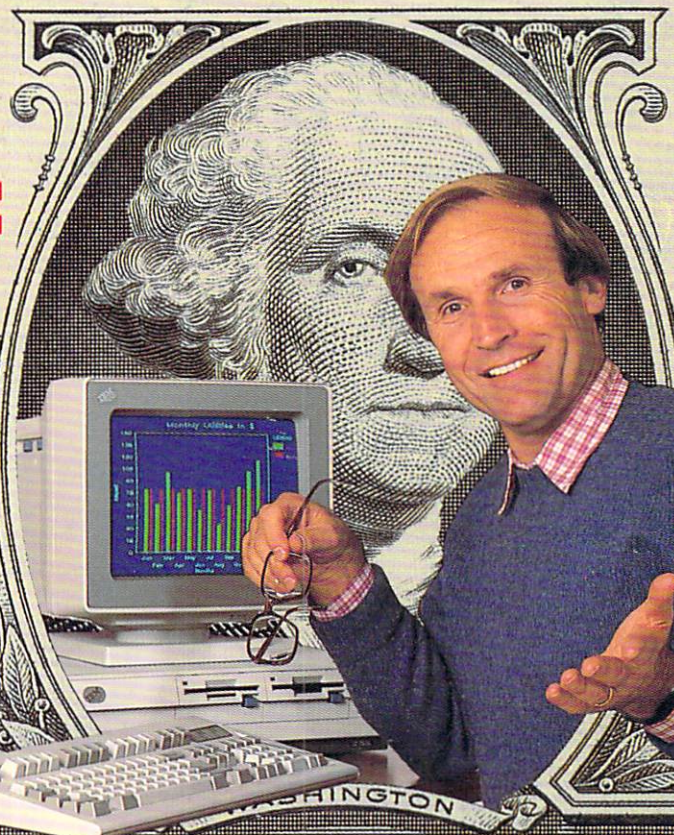
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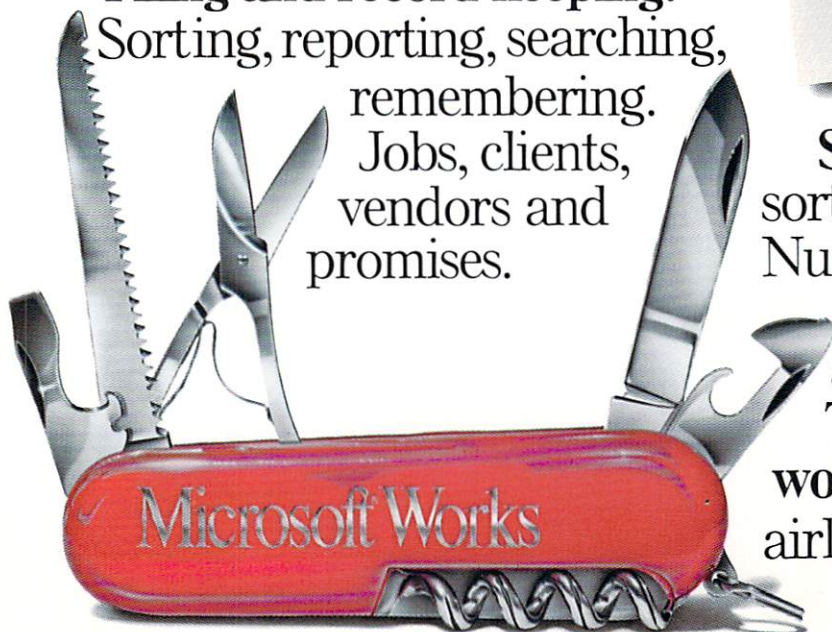
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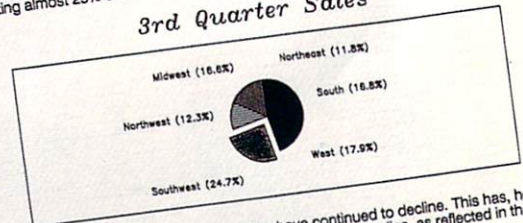
Mr. Jonathan Smith
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Progressive Office Supplies
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Redmond, WA 98073

Dear Jon:

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3rd Quarter Sales



As anticipated, the sales of typewriter supplies have continued to decline. This has, however, been more than offset by the increased sales of computer supplies, as reflected in the table below:

	APRIL	MAY	JUNE	TOTAL
Copier Supplies	\$27,101.22	\$24,458.65	\$33,140.97	\$84,698.84
Computer Supplies	\$36,387.26	\$45,776.13	\$44,600.59	\$126,763.98
Typewriter Supplies	\$42,735.40	\$45,688.66	\$40,214.73	\$128,638.79
Mallroom Supplies	\$45,122.10	\$42,678.40	\$47,603.15	\$135,403.65
TOTAL SALES	\$151,345.98	\$158,599.84	\$165,559.44	\$475,505.26

Again, congratulations to you for such a strong 3rd Quarter. I look forward to thanking you in person at the sales meeting next month in Hawaii.

Sincerely,

Frank Addison
President

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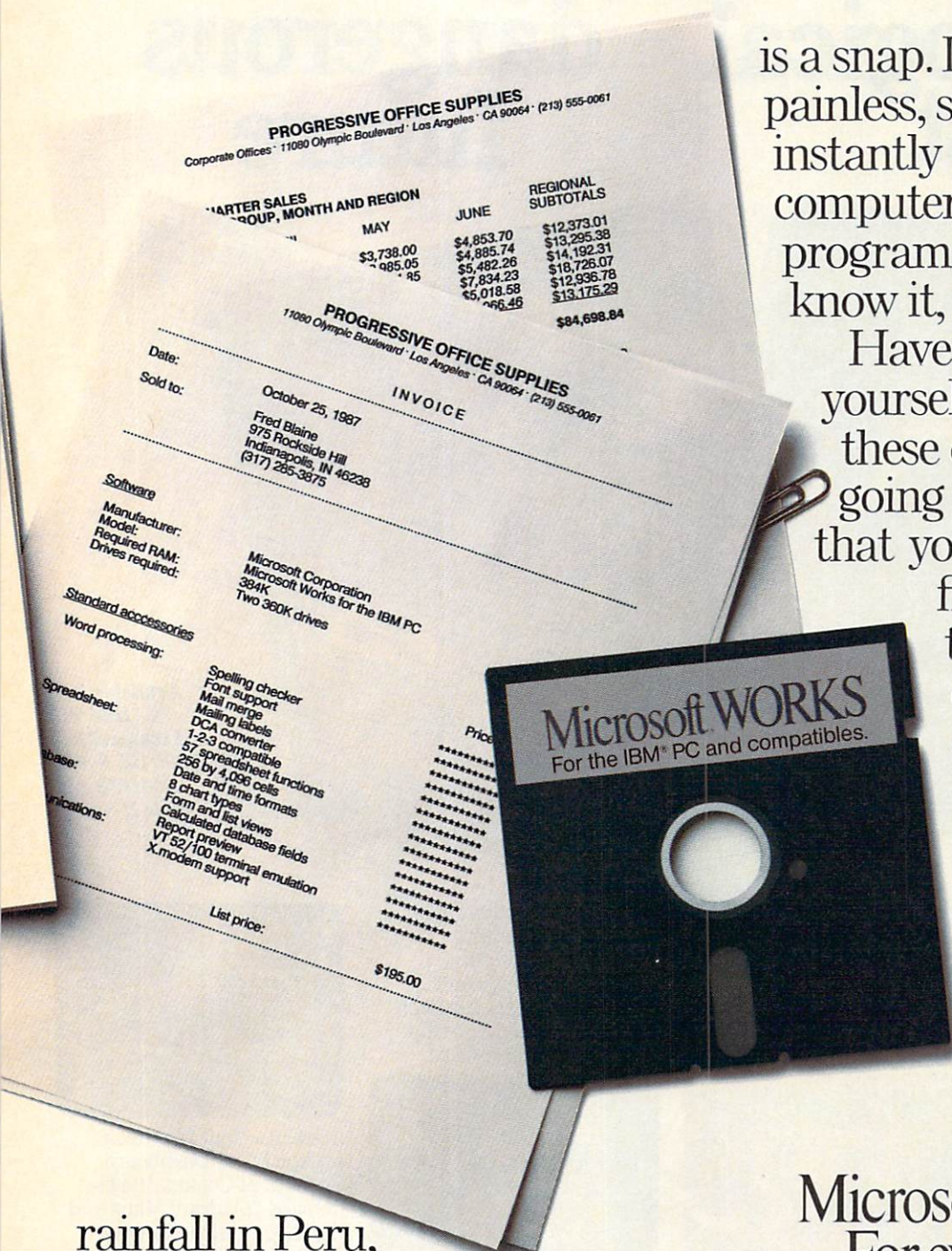
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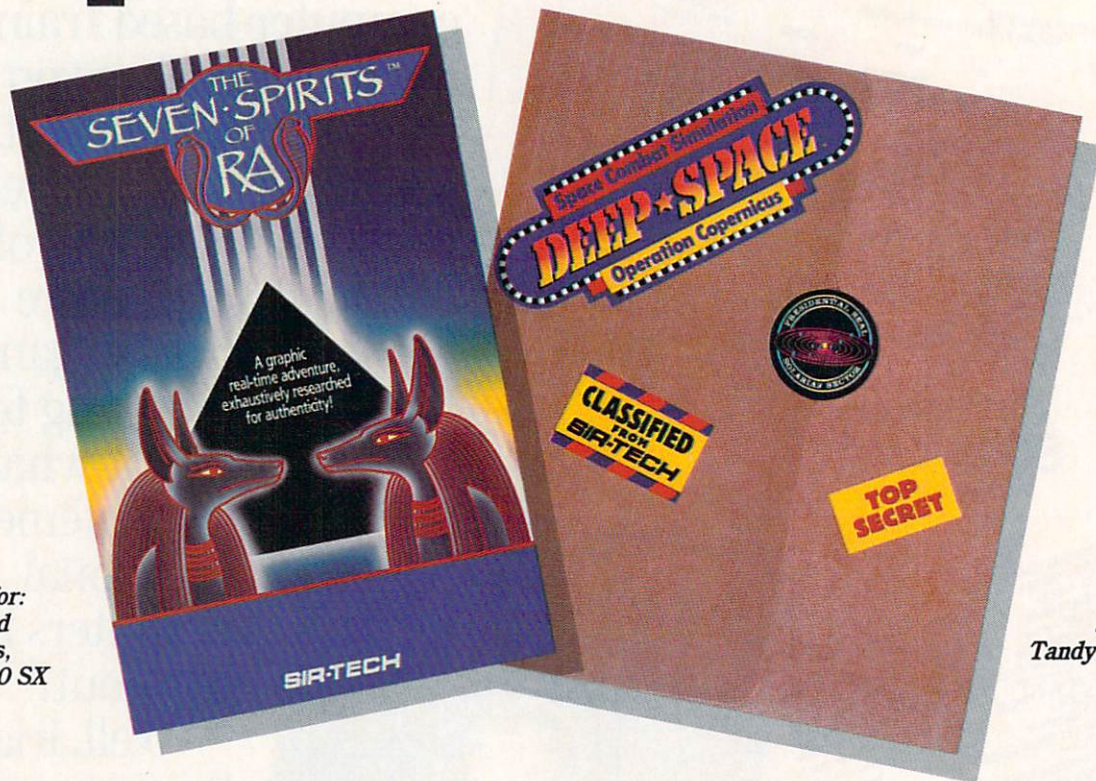
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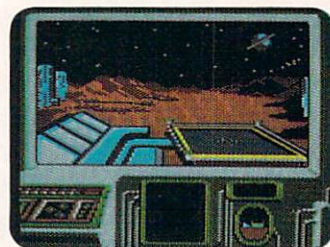


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35

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WHY BORLAND PRESIDENT PHILIPPE KAHN STAYS HOME
A visit with the successful software publisher at his home office—equipped to serve as an extension of corporate headquarters.

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CORPORATE HOMEWORKERS
Find out about the working-at-home phenomenon and discover some tactics for convincing your company to let you try it.

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Learn how telecommuting has opened up new avenues of employment for many disabled workers.

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Industry analysts offer news, opinions, quotes, and rumors about Apple, Atari, Commodore, IBM and MS-DOS, Tandy, and orphaned computers.

56 **NEW!**

USING HYPERCARD
Welcome to our new department devoted to *HyperCard*, the new information-management system for Macintosh computers. THIS MONTH: A conversation with *HyperCard* creator Bill Atkinson. In future issues, look for a host of useful applications for *HyperCard*; news on third-party offerings; and regular *HyperTalk* tutorials.

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THE PROGRAMMER
Programming news, machine coverage, December's *Crossword Puzzler* solution, and this month's programs: *Schedule Planner* (Productivity Program) and *Buzz* (Fun-and-Games Program).

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COVER PHOTOGRAPH BY DONNELLY MARKS

EDITOR'S NOTE

CLOSET WORKAHOLICS AND THE HOME OFFICE

Being a workaholic doesn't seem to have the stigma attached to it that it once did. But I doubt that means that anyone has any less admiration for the laid-back souls around. Perhaps we're becoming increasingly tolerant of individual lifestyles.

I'm sure New York City has a disproportionate number of driven workers. Some are motivated by sheer ambition or greed; others work to keep away the demons; and of course some just love what they do. It's probably pretty much that way everywhere.

Until recently, you always knew who these people were. They lingered at their desks at the end of the day and were on a first-name basis with the maintenance crew; in the morning their wastebaskets were never empty. Co-workers inevitably urged them not to work so hard.

The invasion of computers into the office at first had little effect on the always-hard-at-work. If anything, it increased their numbers, as co-workers struggled to master the technology, to access new streams of information, and to experiment with new ways of doing their work.

When the prices of powerful computers plunged low enough for large numbers of professional workers to purchase their own machines for home use, change set in. And at the end of the standard workday, offices began to empty. Why gobble down a greasy hamburger at your desk when you could savor a homemade dinner between sessions with your database?

Today, it's harder than ever to know who's burning the midnight oil. And it's a lot easier to work to your heart's content without anyone else passing judgment on your work habits. In fact, the work-at-home phenomenon has grown—fueled by the dramatic jump in computer ownership—to the point where stories



Senior Editor Bernadette Grey visits Borland President Philippe Kahn's home office.

about it are now appearing in countless publications.

Watch for next month's report on the 1987 National Work-at-Home Survey by Link Resources. One revealing fact—to jump the gun—is that the number-one reason corporate employees work at home is "to do more work."

This is true at all levels, from those on the way up to those at the top. On page 43, for example, Senior Editor Bernadette Grey reports on her visit to Borland President Philippe Kahn's luxurious mountain home, which for him serves as a second company headquarters (see photo). While few of us can live or work in Kahn's style, it's fascinating to see how a company chief successfully operates beyond traditional corporate boundaries.

Most of us who are or desire to be corporate homeworkers are more like the people described by writer Barbara Stein (page 46). You might decide to follow the suggestions Stein provides for trying to sell your company on the idea. And remember to watch for additional ammunition, appearing next month, to strengthen your argument.

Claudia Cohe

CLAUDIA COHL
EDITOR-IN-CHIEF

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LETTERS

I HATE THE CHANGES!

I have been a proud subscriber to your magazine for three years now, and before that, I purchased it on the newsstand. There have been many changes in staff, format, and style. I used to look forward to the K-POWER section, but that was dropped. I used to look forward to reading the whole issue, but now there are only a few articles I can fully enjoy.

And so I must say good-bye to a close friend, one which grew up with me and then grew beyond me.

TIMOTHY KELLY
Syracuse, New York

WE LOVE THE CHANGES!

How delighted I was to pick up the October issue of FAMILY & HOME-OFFICE COMPUTING and read that your scope has widened to include home-office computing. For months now, I have been "on the fence" about subscribing to another popular magazine or to yours. Both are good, but neither dealt enough with people who work at home with computers. Thank you for expanding to include those of us who do home-office computing, and please enter my subscription.

JEANIE GEIST
Hagerstown, Maryland

FAMILY & HOME-OFFICE COMPUTING is a very popular magazine in my house and neighborhood; there is always something for everyone, and I often use your game reviews when shopping for software. They are very accurate and complete, and the new Entertainment section is great! I've been unstuck countless times by the hints and tips in your former K-POWER section. Your new department seems even bigger and better!

JIM HORNSTEN
Lindstrom, Minnesota

SPECIAL REQUESTS

I have enjoyed the "PC-Compatible Review Series," and I would like to see you review the Vendex HeadStart Turbo 888-XT. I'm thinking of buying one, but haven't seen it reviewed anywhere.

While I appreciate the New Hardware and Accessories department, I would prefer to see product reviews, because it helps to read a knowledgeable person's evaluation of computer equipment.

FRED LONGHENRY, JR.
Westminster, Maryland

EDITOR'S NOTE: *Since you wrote, you may have noticed that the New Hardware & Accessories department has become Product Reviews. In December's column, you'll find a review of the Vendex HeadStart Turbo 888-XT, along with reviews of several other computer peripherals and home-office products.*

Even though I've taken an introductory college course on data processing, this doesn't give me a great deal of computer expertise, and I don't really understand how your programs are written. I would like to see you do a special issue for beginning programmers—from booting up, to formatting a disk, to running programs.

CYNTHIA GRIMES
Mount Pleasant, Tennessee

EDITOR'S NOTE: *If you are interested in learning more about the BASIC programming language, read our two-part "Back to BASIC" programming series (December 1986 and January 1987).*

HARD-DISK OPTION FOR IBM'S MODEL 25

In October's preview of the IBM Model 25, there is a major oversight on the hard-disk option. Mr. Hallerman stated that the Model 25 offers no hard-disk drive option. While it is true that IBM itself does not offer the option, CMS Corporation (1372 Valenchia Ave., Tustin, CA 92689; [714] 259-9555) manufactures 40MB and 20MB hard-drives for the Model 25. This hard drive takes the slot available for the second 3.5-inch floppy drive and also uses one of the expansion slots inside the computer. I recently installed a 20MB CMS drive in a Model 25, and the system operates exceptionally well.

The Model 25 should be a primary contender in the small-business or home-office market with this addition.

GARY SCHRODER, COMPUTERLAND
Quincy, Illinois

ADDING COLOR AND GRAPHICS TO LEADING EDGE

Your readers may be interested to know what we recently discovered when our Leading Edge Model D's monochrome monitor failed.

The computer's built-in CGA and Hercules graphics capabilities meant we were able to simply plug in a compatible color monitor without purchasing an additional color

card (a toggle switch in the back of the CPU enables you to change between monochrome and color). To use EGA graphics, however, you must install an EGA card and disable the Model D's built-in color and graphics by removing the J-10 pin on the motherboard.

SYLVIA J. HJELMELAND
Seattle, Washington

MORE MAIL-ORDER MAIL

I read with great interest the letters by Ms. Redfern and Mr. Krieg in the October issue.

Quaker Enterprises has always had a policy of total and immediate refund if a customer is dissatisfied with any of our "Learning Series" shareware and public-domain software packages. No explanation is ever needed to return a product for a refund.

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VIRGINIA KELLINGER
PRESIDENT, QUAKER ENTERPRISES
Leedsdale, Pennsylvania

CORRECTIONS

A screen photograph identified as *Math Blaster Plus* (Davidson & Associates, Inc.) on page 26 of the November issue is actually from *Math Blaster*, a related program. See page 20 in this issue for a correct screen from *Math Blaster Plus*.

On the same page, the incorrect publisher was listed for *Word Attack*. The package is published by Davidson & Associates (3135 Kashiwa St., Torrance, CA 90505; [213] 534-4070). It's available for the 64K Apple, Atari, C 64/128, 128K IBM PC, and 128K Macintosh at a retail price of \$50 for all versions.

FAMILY & HOME-OFFICE COMPUTING looks forward to letters from readers. Please direct your correspondence to: Letters to the Editor, FAMILY & HOME-OFFICE COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, and telephone number. We reserve the right to edit letters for length and clarity.

Due to the large volume of mail we receive, we are not able to respond personally to every letter or request for information.

Three overlapping floppy disk magazine covers are shown against a dark blue background. The top-left cover is 'BIG BLUE DISK', issue NO. 17, with a blue and white design featuring a computer monitor and keyboard. The middle cover is 'LOADSTAR', issue NO. 27, with a purple and orange design featuring a jukebox. The bottom-right cover is 'Softdisk', issue NO. 18, with a red and white design featuring a pair of sunglasses. Each cover has a 'TWO DISK' label in the top right corner and a barcode at the bottom.

Rating – FAMILY COMPUTING MAGAZINE

Available at Waldenbooks, B. Dalton Booksellers and computer stores everywhere. (Cover price: \$9.95)

CIRCLE READER SERVICE 22

THE OFFICE AT HOME

HOME-OFFICE TAX DEDUCTIONS

Where You Stand Under the New Tax Law

BY JOE ROTELLO

In October 1986, President Reagan signed into law the most significant tax legislation since 1954. It has been called a landmark law because it offers lower tax rates, fewer deductions, and a big shift in tax liability from individuals to corporations. The new law's provisions will affect every American taxpayer, including those who operate offices in their homes.

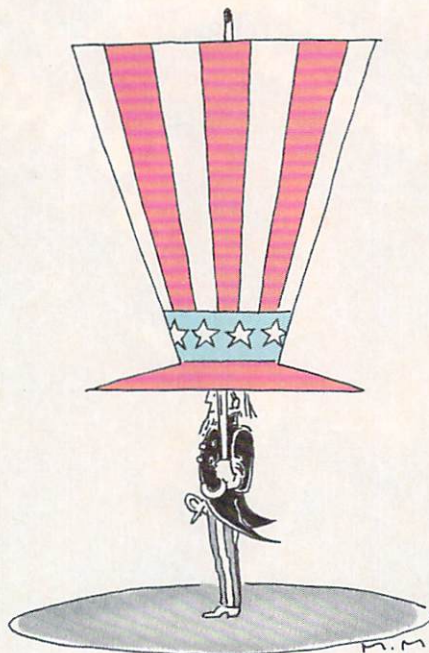
Many of the new law's provisions became effective in the 1987 tax year, and the rest will be phased in gradually (see "New Tax Law Provisions Affecting Home-Office Filers"). This easing in of the new rules, along with major differences between the old tax law and the new one, has made tax planning imperative for those accustomed to taking deductions.

In most instances, there's no clear dividing line between the standard taxpayer and one who operates a home office. The home you live in and the home you work in are, for the most part, inseparable. The money you make is generally considered "just one more source of income," according to the Internal Revenue Service (IRS). But here and there you can find differences that will change your taxes. For example, since one advantage of maintaining a home office is the numerous deductions you can take, a law that allows fewer deductions is probably going to hurt you.

Here's a rundown of key points of the current tax law that affect those who take deductions for sole proprietorship, self-employment, moonlighting, or job-related expenses.

SCHEDULE C

If you run a business of your own, whether it's full-time or part-time, you're expected to file Schedule C (Profit or Loss from Business or Profession: Sole Proprietorship) with Form 1040. (If you earn more than \$400, you're also expected to compute your Social Security payments on Form SE.) You cannot use Sched-



ule C if you are employed by someone else unless, of course, you operate a side business of your own.

One of the first questions on Schedule C is, "Did you deduct expenses for an office in your home?" If you use any part of your home exclusively for business, you should certainly answer yes, because there are benefits. At the same time, you should be sure you have accurate records, because the IRS has been on the lookout for home-office scams.

For instance, if one-sixth (in square feet) of your home is devoted to office space, you can deduct one-sixth of your rent, one-sixth of your utility bill, one-sixth of your home insurance, and one-sixth of any other general home-maintenance expenses. The only requirement is that your home office be a dedicated work area and not used for anything else, such as a guest room, den, or "TV nook." Consult the IRS pamphlet *Business Use of Your Home* (#587; [800] 424-3676) for more information.

In the past, many taxpayers took a net loss on Schedule C to offset other income. That is much more difficult to do now. Previously, a taxpayer could take office deductions (such as rent and electricity) up to

the amount of gross income and then write off non-office expenses, thus taking a loss. Now, the taxpayer must deduct non-office expenses (such as advertising and supplies) from his or her gross income and then deduct office expenses up to the amount of the remaining net income.

To make up for this thorn, the IRS now allows Schedule C filers to carry over deductions for several years. Thus, if you're making heavy expenditures for a few years when your income is low, you can save some deductions for the time when your income increases.

Another advantage of Schedule C is that you can take deductions for the purchase of computers and office equipment (see page 10), which is hard to do otherwise. Generally, you can depreciate this equipment over a five-year period.

CAR DEDUCTIONS

If a car is crucial to your business, you can write off at least a portion of its cost by depreciating its value over a period of years. But the depreciation period has been stretched from three years to five years, thus giving you less of a write-off each year.

You also can deduct the cost of operating a car. The general rule is that a taxpayer may deduct car expenses when his or her main office is at home, providing the individual can prove that when driving, he or she is not commuting to an outside office. For example, most doctors who practice in a clinic that is outside their home cannot deduct car expenses for driving to the clinic—the rule being that the doctor's principal office is the clinic, even if some records are stored at home, or even if the home has a dedicated study area.

When your office is at home, the cost of driving from your home to see clients, customers, or patients, and returning to the home office is deductible. As columnist and certified public accountant A.J. Cook (author of *A.J.'s Tax Court*) is wont to say: "If your main business address is at home, you 'auto' get a tax deduction!"

JOE ROTELLO is a consultant and editor—publisher of The Home Office Newsletter (THON), distributed on GENIE.

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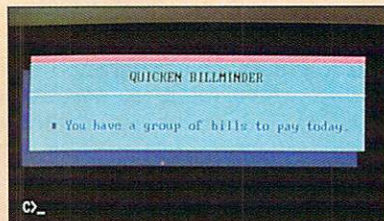
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THE OFFICE AT HOME

Car expenses include gas, oil, repairs, tires, insurance, parking fees, tolls, and car washes. More important, your car deduction is based on your percentage of business use. If 50 percent of your total mileage for the year was for business trips, then you can deduct 50 percent of your car expenses.

If you don't keep careful records of your travel expenses, use the stan-

dard mileage rate. For tax year 1987, you can deduct 22.5 cents for each of the first 15,000 business miles and 11 cents for each succeeding business mile.

COMPUTER PURCHASE

If you purchased a computer (or other office equipment) to do job-related work at home for an employer, you have almost no chance of

writing it off. Recent IRS rulings further restrict computer deductions; a taxpayer must now prove that the purchase of a computer was a "condition of employment." That can be difficult to do, especially since it's rarely true.

However, if you bought a computer or office equipment for a home-based business in 1986, you can write off (or "expense") up to \$10,000 and depreciate the remaining amount over a five-year period. The amount you can expense has risen from \$5,000 in 1986, so the change is obviously a break for home-based businesses.

NEW TAX LAW PROVISIONS AFFECTING HOME-OFFICE FILERS

Old Law 1986

New Law 1987-88

SALES TAXES:

Deductible Not deductible

MORTGAGE INTEREST EXPENSE:

Mortgage interest deductible on first and second residence. On loans made after August 16, 1986, deduction is limited to the basis (cost) of the house, except for educational or medical expenses.

CONSUMER INTEREST EXPENSE:

Allowed 100% Allows 65% in 1987. Allows 40% in 1988, 20% in 1989, 10% in 1990. Not allowed after 1990.

THE TWO-EARNER DEDUCTION:

Limited to 10% of earned income of lower earning spouse. The maximum deduction is \$3,000. Repealed

INDIVIDUAL RETIREMENT ACCOUNTS:

If taxpayer and spouse are *not* active participants in a pension plan:

\$2,000 for each taxpayer Same as 1986
\$2,250 for taxpayer and spouse

If either taxpayer is an active participant in a pension plan:

\$2,000 each taxpayer Deduction is still allowed as long as the adjusted gross income before the IRA deduction is \$40,000 or below on a joint return or \$25,000 or below for a single filer. The deduction begins to phase out once adjusted gross income exceeds these amounts and is completely eliminated after reaching \$50,000 on a joint return or \$35,000 for the single filer. An individual will still be allowed to contribute the phaseout portion.
\$2,250 with spouse

401-K PLANS:

\$30,000 maximum annual deferral \$7,000 maximum annual deferral allowed. New 10% penalty imposed on hardship withdrawals.

INCOME AVERAGING:

Same as 1985 Repealed

EMPLOYEE BUSINESS EXPENSES:

Treated as a deduction in computing adjusted gross income Treated as a miscellaneous itemized deduction. Only the amount exceeding 2% of the adjusted gross income can be applied

JOB-RELATED MOVING EXPENSES, WORK EXPENSES FOR DISABLED:

Deduction for adjusted gross income (adjustment) Itemized deduction not subject to the 2% deductible.

CHILDREN'S TAXES:

Taxed at child's rate Unearned income taxed at parents' rate if child is under 14 years old and income exceeds \$1,000

BUSINESS MEALS:

Allowed 100% if an ordinary and necessary business expense Only 80% of business meals will be allowed as a business deduction.

RESIDENTIAL ENERGY CREDIT:

Was repealed after 1985 Repealed

SOURCE: The tax chart was prepared by Sidney J. Burns, CPA, a principal in the accounting firm of Burns and Millington, P.A., White Oak Center, Suite 507, 11120 New Hampshire Avenue, Silver Spring, MD 20904.

THE S CORPORATION

Accountants, consultants, medical professionals, and others prefer to conduct business by setting up "S Corporations," sometimes known as "Subchapter S Corporations." S Corporations are generally owned by one person or several members of a family. The advantage is that you can operate as a "closely held corporation," without paying a corporate tax. You can separate your personal affairs from your business affairs, rather than mixing them together. Normally a fairly attractive way to do business, the S Corporation is an even better bet under the new tax law, with its lower personal-tax rates.

The new tax law makes one minor change that could be important to watch. It stipulates that an S Corporation generally must use a calendar year as its tax year. The only exception will be if your business must operate on a fiscal year for legitimate reasons that can be proved. Under the old law, you could have ended your fiscal year in September 1986, say, and not paid taxes on income for October, November, and December until April 1988.

The rules for Subchapter S are somewhat complex and can be broken unintentionally. In that case, you might lose S Corporation status and the consequent tax advantages. If you're in doubt about how the new tax law affects S Corporations, see a qualified tax accountant.

ODDS AND ENDS

Besides the major deductions, other changes in the tax law might affect those who run home offices. Here's a quick look at some of the changes:

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CIRCLE READER SERVICE 8

Upcoming Features in

FAMILY & HOME OFFICE COMPUTING

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Printers and Plotters

The Graphic Side of
Business Presentations

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Word Processors
That Take
Care of Business

THE OFFICE AT HOME

• The tax benefits of shifting income from parents to children, long the practice in many family businesses, are reduced considerably under the new tax law. Children under 14 years of age will be taxed at the parents' rate. Note that by April 15, 1988, every child aged 5 and older who receives income must have a Social Security number.

• Independent consultants across the country are up in arms about the new tax law, specifically Section 1706 of the code. If left intact by Congress, these changes would strip most consultants—most notably computer consultants—of valuable tax status, effectively making them employees of the clients they serve. This, of course, would make clients less willing to hire independent consultants. However, Congress is re-evaluating the controversial clause. And, while it's still on the books, insiders say that Uncle Sam will not take steps to enforce it closely.

• Only 80 percent of business meals is now deductible, compared to a full 100 percent under the old law.

• From 1987 through 1989, self-employed taxpayers may deduct 25 percent of their health-insurance premiums.

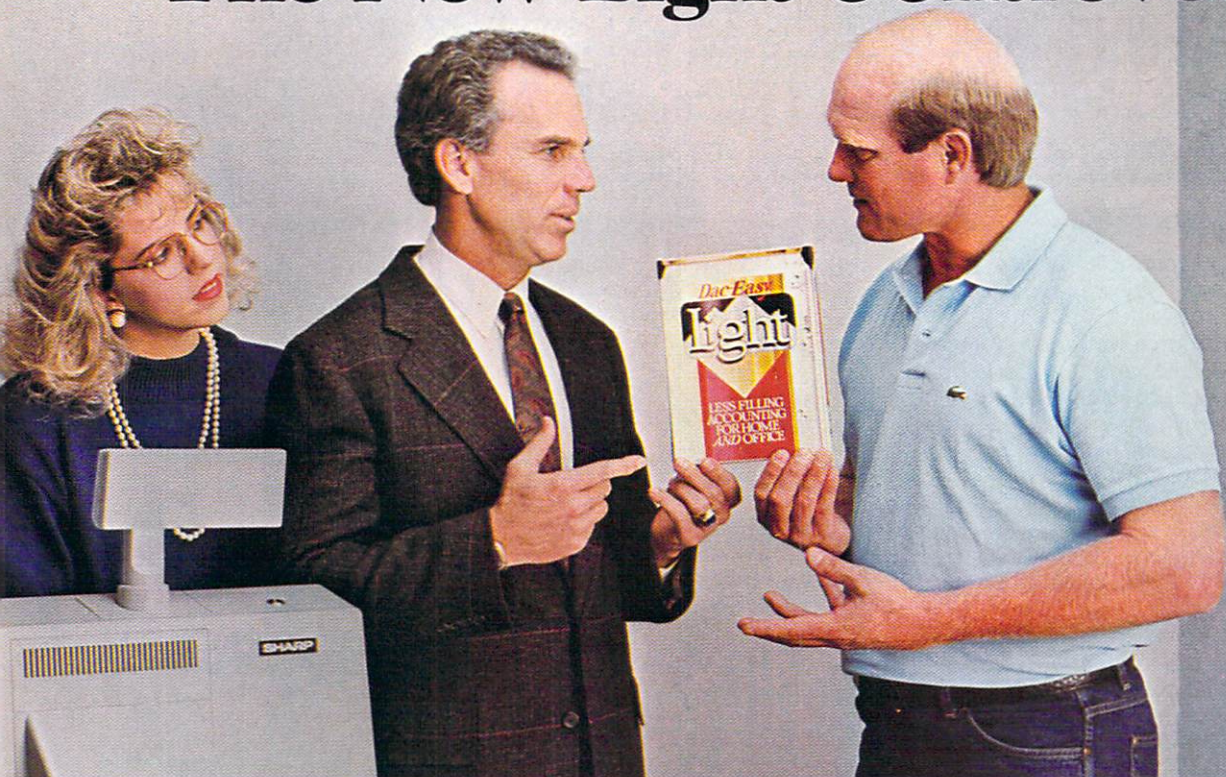
• Finally, if you bought a new home after December 31, 1986, and wish to write off the portion of it that will be used as an office, you must depreciate it over 31.5 years. This long-term write-off is a change for the worse. From 1981 through the end of 1986, the law had allowed you to depreciate your home over 15 to 19 years.

TIMELY TAX BREAKS

Despite much of the bad news, taxes and the home office don't always combine to mean a bigger tax bite. On the contrary, the home office can be a wellspring of business satisfaction and income, as well as the source of some timely tax breaks and deductions for which ordinary homeowners are ineligible. The keys are an understanding of the tax laws as they relate to your home office and planning and action before tax time rolls around each year.

Now is a good time to start your planning for 1988. Laying out your tax strategies before the high pressure of tax time hits will pay many dividends, allowing both you and your tax adviser to do a better job. ■

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CIRCLE READER SERVICE 7

TELECOMPUTING

JOB TRAINING AND PLACEMENT FOR THE HOMEBOUND

Computers, Modems, and Facsimile Machines Help Physically Disabled Workers Find Jobs

BY LYNIE ARDEN

In 1976, Carol D'Agostino's life was on a downhill track. She was recently divorced and in need of a job. Re-entering the work force would be tough, she discovered, and for D'Agostino—who is physically disabled—it was nearly impossible.

Taking in boarders in her Long Island home provided some income, but she soon discovered that was a difficult way to make a living. "It was eroding my health even further," she says. "I needed something else, something better."

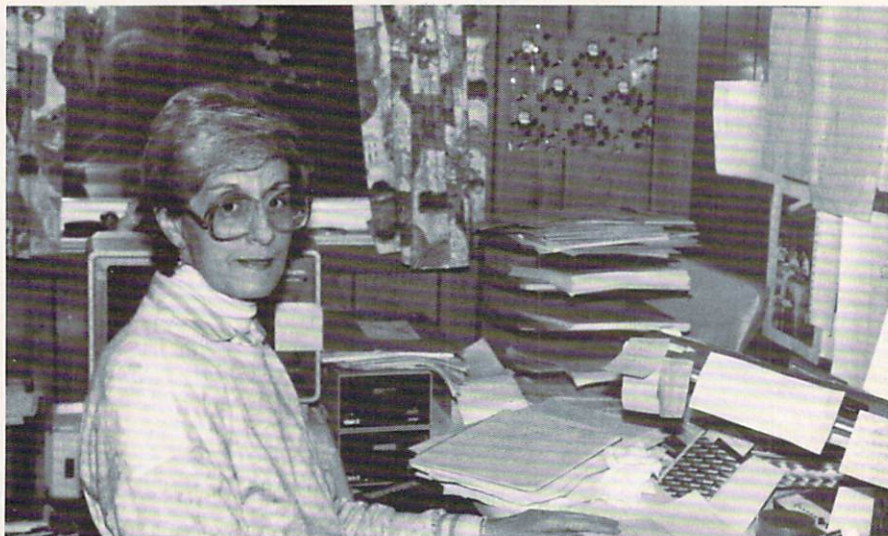
D'Agostino heard about the External Education Program for the Homebound at Queensborough Community College in New York and enrolled with the hope of upgrading her rusty office skills.

The college loaned her an Apple II Plus and sent lessons to her home via a telephone-modem hookup from the classroom. Before long, she had honed the word-processing skills necessary for an internship program that required she work 90 hours. She was given a list of participating companies to contact.

There were some interesting choices available. Some of her classmates opted for word-processing and secretarial work. Others went to work for accounting firms. One went to work for the Metropolitan Opera Guild, adapting librettos for children. Another evaluated consumer responses to television programming on the local PBS station. Still another produced a hospital newsletter.

D'Agostino chose to intern with Electronic Services Unlimited (ESU), a New York-based research and consulting firm that plans, advises, and implements telecommuting programs for major corporate clients. She was hired sight unseen and worked for ESU for a year before she met her boss. The internship later evolved into a permanent job.

Contributing editor LYNIE ARDEN, who wrote "The Top 10 Computer-Based Home Businesses" in the June 1987 issue, is author of The Work-At-Home Sourcebook (TWN Publications, P.O. Box 820, Rancho Cordova, CA 95741; \$12.95, plus \$1 shipping).



Carol D'Agostino works from home for Electronic Services Unlimited, a New York research firm.

D'Agostino receives work assignments electronically, by modem. She handles database management, miscellaneous word processing, mailings and research, and is now the editor for the company newsletter, *TeleCommunting Report*.

While D'Agostino originally intended only to upgrade her skills to improve her job prospects, she is now taking business courses while working toward an Associate of Applied Science (A.A.S.) degree.

"Thanks to the Homebound program, I have new skills and new confidence," says D'Agostino. "I went from no opportunities to unlimited opportunities. I'll never be unemployed again!"

D'Agostino is one of millions of homebound, disabled people in the United States, the majority of whom are unemployed. Many have limited mobility, but have no special handicaps that severely affect their ability to work. The resulting cost to society is staggering.

High-tech aids—such as modems, facsimile machines, and phone dictation systems—and the snowballing trend in telecommuting are breaking down the employment barriers for the disabled. With appropriate short-term training and a relatively small investment in home-office equip-

ment, the disabled worker can now become self-sufficient. All that are needed are training programs and open-minded employers.

CONTROL DATA'S ALTERNATIVE WORK SITES

Control Data, a mainframe computer manufacturer, started Alternative Work Sites to help its disabled employees continue working at home. "We might have a programmer or maybe a manager who becomes a quadriplegic because of an accident," says director Helen Fleck. "While this person may be perfectly capable of working at home and coming in part-time for meetings and such, being able to come in to work every day for eight hours is out of the question."

The program's employee benefits depend on the person's job prior to the disability. A programmer, for instance, only needs to be outfitted with similar equipment at home to continue the same job.

But many jobs aren't suited to a work-at-home arrangement. In this case, the employee must be retrained to do work that he or she can perform at home. If a person who works on the factory line is struck by a debilitating disease, he or she might be retrained to work on

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TELECOMPUTING

computerized inventory control. For this purpose, Control Data developed job-training software that is provided along with the computer hardware and modem. This training is provided free of charge, and the employee's salary and benefits continue throughout the transition.

AMERICAN EXPRESS'S OFF-SITE PROCESSING

The first company to initiate a homebound-disabled work program that utilized two-way telecommunications (no travel required by workers or couriers) was American Express Bank Ltd., the wholly owned international banking arm of American Express Company. Project Homebound began in 1982 as a nine-month pilot project involving physically and emotionally handicapped men and women. It is now integrated into the company's overall operation.

The 15 original participants were selected from a group of 200 volunteers. Brooklyn College in New York developed a word-processing training program especially for the project. All 15 workers completed training with flying colors. Five were hired by Equitable Life Assurance Society, the other 10 by American Express.

Each participant's home workstation was furnished with a Wang word-processing terminal, a Lanier central-dictation system, and an Exon facsimile machine. Telephone lines link the home workstation to the company headquarters on Wall Street. A company supervisor can dictate into the system from anywhere; likewise, the homemaker is able to connect to the system 24 hours a day and transcribe the dictation onto the word processor. The finished product, in hard-copy form, is then sent back to headquarters via modem.

The productivity level of at-home workers is equal to or better than that of in-house company workers, according to the company. American Express has proven that with proper training—coupled with today's low-cost, high-power computer systems and office equipment—disabled people can become productive, valued members of the work force.

LIFT, INC.'S PROGRAMMERS

Lift, Inc., is a nonprofit organization that recruits, trains, and places severely physically disabled people as

home-based computer programmers for more than 70 corporate employers. Plans are under way to offer jobs in computer-aided design and manufacturing, too.

Only applicants with severe but stable disabilities, such as multiple sclerosis or impaired limbs, are accepted. There are also programs designed for the blind.

Standard aptitude tests are applied to measure such characteristics as motivation, self-control, and talent for computer programming and analytical problem solving.

Occasionally the candidate already has some training, but it's not a prerequisite for entry into the program. Each individual is trained to specifically meet the needs of a corporate client. Therefore, the computer language and the equipment are the employer's choice. Most candidates are trained in programming and systems applications.

After completing the training, the programmer works under contract with Lift for one year. The salaries will, of course, vary according to such criteria as past experience. But a programmer will earn between \$19,000–\$26,000. Medical and life insurance are also provided. When the year is up, the corporate employer then has the option of employing the programmer. Lift's placement record is exceptional; over a 13-year period, 94 percent of Lift trainees are still with their original employers.

Lift operates in 15 states now, but has plans to expand into five more this year.

RESOURCES

Automated Office Skills Training Program; Director: Pearl Bass; (212) 206-4200

Lift, Inc.; President: G. William Woerner, Jr.; (312) 564-9005

National Special Education Alliance, Apple Computer Office of Special Education; Director: Alan Brightman; (408) 996-1010

Queensborough Community College, External Education Program for the Homebound; Director: Merrill Para; (718) 631-6262

Handicapped Users Database, CompuServe; (GO HUD)

Job Hunting for the Disabled: A Search for Dignity, by Edith Marks and Adele Lewis; Barron's Educational Series Inc.; Hauppauge, NY; \$9.95

AUTOMATED OFFICE SKILLS TRAINING PROGRAM

Automated Office Skills Training Program (AOSTP) operates in New York City under the umbrella of the Federation of the Handicapped. AOSTP is a service bureau employing handicapped home-based word-processing and telecommunications specialists.

Training is conducted in the use of the hardware and software plus any other areas in which an individual might need special help.

The work itself is done mostly at home. Couriers deliver supplies and pick up finished work. Computers, telecommunications equipment, and a phone-in dictation system are provided by AOSTP.

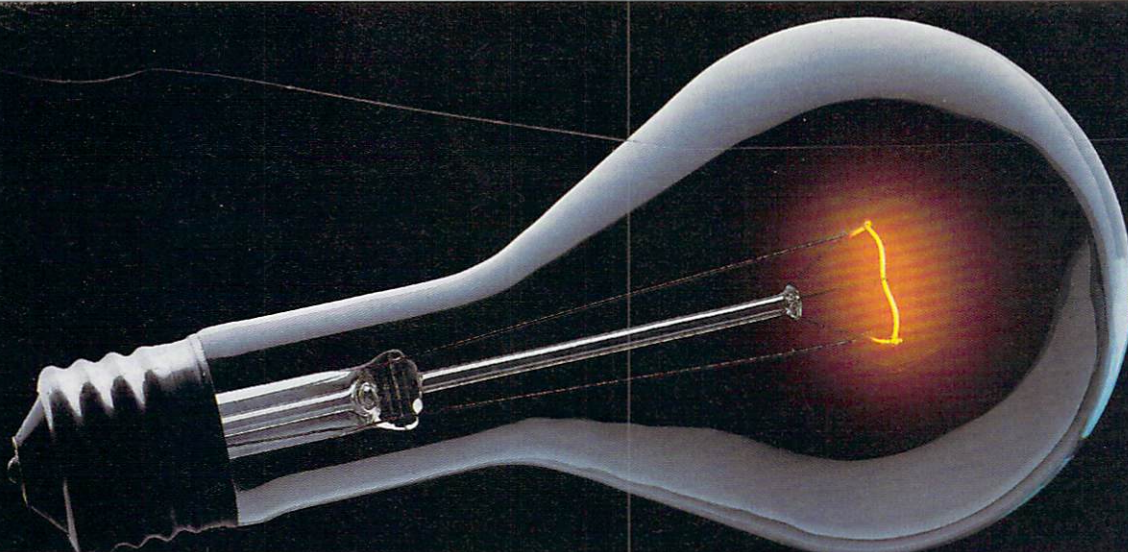
The work is dictated over the phone and transcribed by the homemaker. The completed reports are then either transmitted back to AOSTP for printout and delivery, or, in the case where the client's equipment is compatible, they're transmitted directly to the client.

Although this program is fairly new, its growing list of clients includes the New York City Probation Department, the Department of Consumer Affairs, the Department of Social Security, and the Environmental Protection Agency.

DISABILITY IS NOT A HANDICAP

These examples of training services and corporate employment attitudes show that a disability doesn't have to be a handicap. If you are disabled and unemployed, the companies, organizations, and publications in "Resources" will help you on your way to becoming independent.

You can also start by contacting your State Department of Vocational Rehabilitation. Look in the phone book under the State Government listings for the regional office nearest you. Simply call and explain your situation, and ask for help locating work. You'll be assigned to a counselor, and arrangements for an interview will be made. The counselor will then be responsible for making a complete evaluation of your particular situation, including your medical history, work experience, physical surroundings, aptitude, disability insurance, and so forth. You have a better chance of finding an appropriate situation through a counselor than you will going it alone. ■



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HOME-SCHOOL CONNECTION

MATH SOFTWARE YOU CAN COUNT ON

A Look at Programs for Youngsters That Teach Addition, Subtraction, Multiplication, Division, and More

BY MARLENE BUMGARNER ELTGROTH

For children in elementary school, math can be tough. It's the subject that's most likely to end up as an after-dinner family affair. After the dishes have been cleared away, pencils, erasers, and paper are spread out on the table, and parent and child tackle division or fractions.

One reason youngsters struggle with math homework is because there's so much to learn. A math teacher once told me, "I teach fourth-grade and sixth-grade math classes every day. Forty minutes a day—that's all I get." According to this teacher, those 40 minutes aren't nearly long enough. So how do we, as parents, extend that time and keep our children motivated and interested?

Good math software for home use is one possibility. However, there seems to be so much of it on the market that deciding which packages to purchase becomes as time-consuming as finding a lowest common denominator.

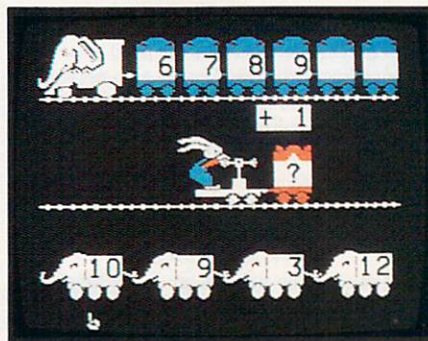
This article focuses on software for children who are learning the fundamental concepts of math: addition, subtraction, multiplication, division, fractions, decimals, and percents. Most of the programs use computer graphics and sound to create rewards and encourage motivation and enthusiasm. The best ones have different skill levels so they can be used by more than one age group.

Children learn better if a parent becomes involved in the learning process, so try to spend time with your children at the computer. Try the program by yourself when you first purchase it and demonstrate its use to your children later. Stay close by as they learn the operational keystrokes. Praise them for high scores and laugh at the antics of the program's characters. If the package is

in game format, play along with your children. Plan to assist from time to time in problem solving—many children need an adult's help with logic and strategy, as well as with the mechanical difficulties of learning to use a new program. Parents I interviewed agreed that children use their educational software far more when it is a social activity and not an isolating one.

BEGIN WITH ADDITION AND SUBTRACTION

Moving from concrete activities, such as adding alphabet building blocks, to more abstract ones, such as manipulating symbols themselves, can be a big jump for kids. Computer software often *visually* reinforces the fact that numbers represent concrete objects.



Math Rabbit

★ *Math Rabbit*, one of the most popular math programs on the market, takes children into a circus ring of animals and performers. They learn counting and number recognition and then progress to adding, subtracting, identifying equalities and inequalities, and recognizing number relationships and patterns. Lively music and a dancing rabbit entertain and motivate children as they explore the world of numbers. For ages 4–7. (\$40; 64K Apple, IBM PC and compatibles. The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555; [415] 792-2101.)

★ *Stickybear Math* is another suitable package for young children who

are learning basic arithmetic. Even children as young as 4 and 5 can have fun solving addition and subtraction problems on the computer. Sound and graphics contribute to the child's understanding of grouping in addition and subtraction; the objects are placed in formation before the child is asked for the numerical answer. A special parent option lets you set the appropriate level for your child. For ages 6–9. (\$30–\$40; Apple, C 64/128, IBM PC and compatibles. Weekly Reader Family Software/Optimum Resource, 10 Station Place, Norfolk, CT 06058; [203] 542-5553.)

★ *1st Math*, a more recent offering, also moves the objects around the screen to show the arithmetic operation. The large numbers and letters and colorful graphics appeal to my 7-year-old daughter, Jamie, who enjoys watching animated pictures being built piece by piece as she solves the math equations. For ages 5–8. (\$40; Atari ST, IBM PC and compatibles. Stone & Associates, 7910 Ivanhoe Ave., Suite #319, La Jolla, CA 92037; [619] 459-9173.)

MOVE ON TO MULTIPLICATION AND DIVISION

A solid understanding of multiplication and division is based upon knowing the multiplication tables and being able to visualize carrying and borrowing operations. Programs that show the process step-by-step can help children remember these often confusing tasks.

★ *Stickybear Math 2* brings back Stickybear in a practice program for multiplication and division. Horizontal and vertical problems are displayed with up to four-digit numbers. The computer automatically adjusts the level of skill according to the child's success, or you can set it manually. For ages 7–12. (\$30–\$40; Apple, C 64/128, IBM PC and compatibles. Weekly Reader Family Software/Optimum Resource [see above].)

MARLENE BUMGARNER ELTGROTH, of Morgan Hill, California, has written extensively in the fields of education and computer learning and serves as an educational consultant to public and private schools. She can be reached on CompuServe (ID: 73577,1632).

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DesignWare's entertaining software grows with your children — to keep learning alive. Juanita improves word recognition and spelling with **Spellicopter®**, a fast-paced helicopter rescue game (for ages 6–10). And she learns to think fast as she masters arithmetic facts with **Math Maze®** (for ages 6–11).

Give teens a homework advantage.

Skip starts out as cub reporter and works his way up to editor-in-chief in the fun-filled **Grammar Examiner™**. And he becomes as knowledgeable as a seasoned U.S. traveler with **States & Traits™**. (Both programs are from **DesignWare** and both are for ages 10 & up.)

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HOME-SCHOOL CONNECTION

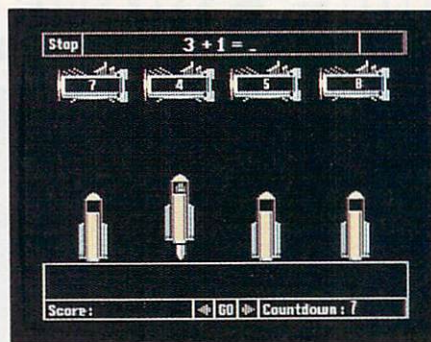
★ *2nd Math* actually pulls the numbers out of the two- and three-digit multiplication and division problems to show the breakdown of how the ones and the tens must be added or subtracted. Carrying and borrowing are demonstrated with colorful graphics. A parent option lets you personalize the program with secret messages about family birthdays and favorite foods to make special rewards for your young mathematician. For ages 8–14. (\$40; IBM PC and compatibles. Stone & Associates [see page 18].)

TIE IT ALL TOGETHER

Some programs cover all the basic concepts in one package. They usually address a wide range of ages and have multiple levels of difficulty. Most packages include drill-and-practice sections. Be sure that your children's math facts are well-memorized before beginning on reinforcement, since the timed responses may cause frustration. Here are some programs your children might enjoy:

★ *Mathtalk* and *Mathtalk Fractions* are for Amiga, Apple IIGs, Atari ST, and Macintosh owners. Your children can use *Mathtalk* and *Mathtalk Fractions* to take advantage of the latest advances in computer-sound technology. *Mathtalk* helps children master addition, subtraction, multiplication, and division for four- to six-digit numbers; *Mathtalk Fractions* helps make the connections among fractions, decimals, and percents. These packages also let children enter their own problems and actually "tell" them the steps to follow in borrowing, carrying, and performing long division. (The computer's voice is somewhat robotlike, which I found distracting, but my young testers loved it.) *Mathtalk*, for ages 6–12; *Mathtalk Fractions*, for ages 8–12. (\$50 each; Amiga, 512K Apple IIGs, Atari ST, Macintosh. First Byte/Electronic Arts, 820 Gateway Drive, San Mateo, CA 94404; [415] 571-7171.)

★ *Math Blaster!* and *Math Blaster Plus!* encourage children to practice all their basic math skills—addition, subtraction, multiplication, and division, including fractions, decimals, and percents. A veritable encyclopedia of math facts, *Math Blaster!* presents more than 600 problems in drill and practice. The newer *Math*



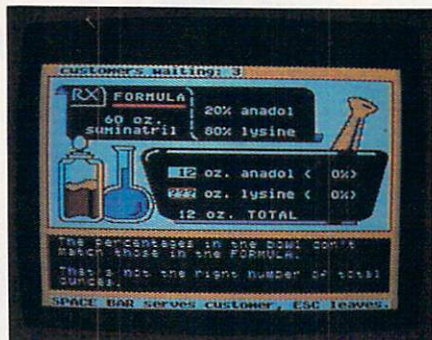
Math Blaster Plus

Blaster Plus! covers more than 750 problems, including problem solving as well as drill and practice. Nine-year-old Christina Holzer, of Irvington, New York, enjoys sitting at her father's desk and playing *Math Blaster!* However, her father points out that the arcade part of the package moves very quickly and cannot be successfully completed by some beginners even at the slowest speed. A good introduction to both of these programs is Davidson & Associates's *Math and Me*, which develops confidence in early math skills, from shapes, numbers, and pattern recognition to addition of single-digit numbers. It's for ages 3–6 and is available for Apple II series and IBM PC and compatibles for \$40. *Math Blaster!* and *Math Blaster Plus!* are for ages 6–12. (*Math Blaster!*, \$50; Apple, Atari, C 64/128, IBM PC and compatibles, Macintosh. *Math Blaster Plus!*, \$50; 128K Apple, 256K IBM PC and compatibles. Davidson & Associates, 3135 Kashiwa Steet, Torrance, CA 90505; [213] 534-4070.)

★ *Piece of Cake Math* sounds appetizing, but it won't give your children cavities. Using the theme of a bakery, the program helps children visualize and solve word problems by looking at graphic representations of addition, subtraction, multiplication, and division with "Bakery," "Multicake," and "Dividacake." The "Electronic Flashcards" game provides practice sessions in math facts and helps to develop carrying, borrowing, and problem-solving strategies at advanced levels, while an arcade-style contest "Catch-a-cake" builds speed and accuracy. For ages 7–13. (\$35; Apple, C 64/128, IBM PC and compatibles. Springboard Software, Inc., 7808 Creekridge Circle, Minneapolis, MN 55435; [612] 944-3915.)

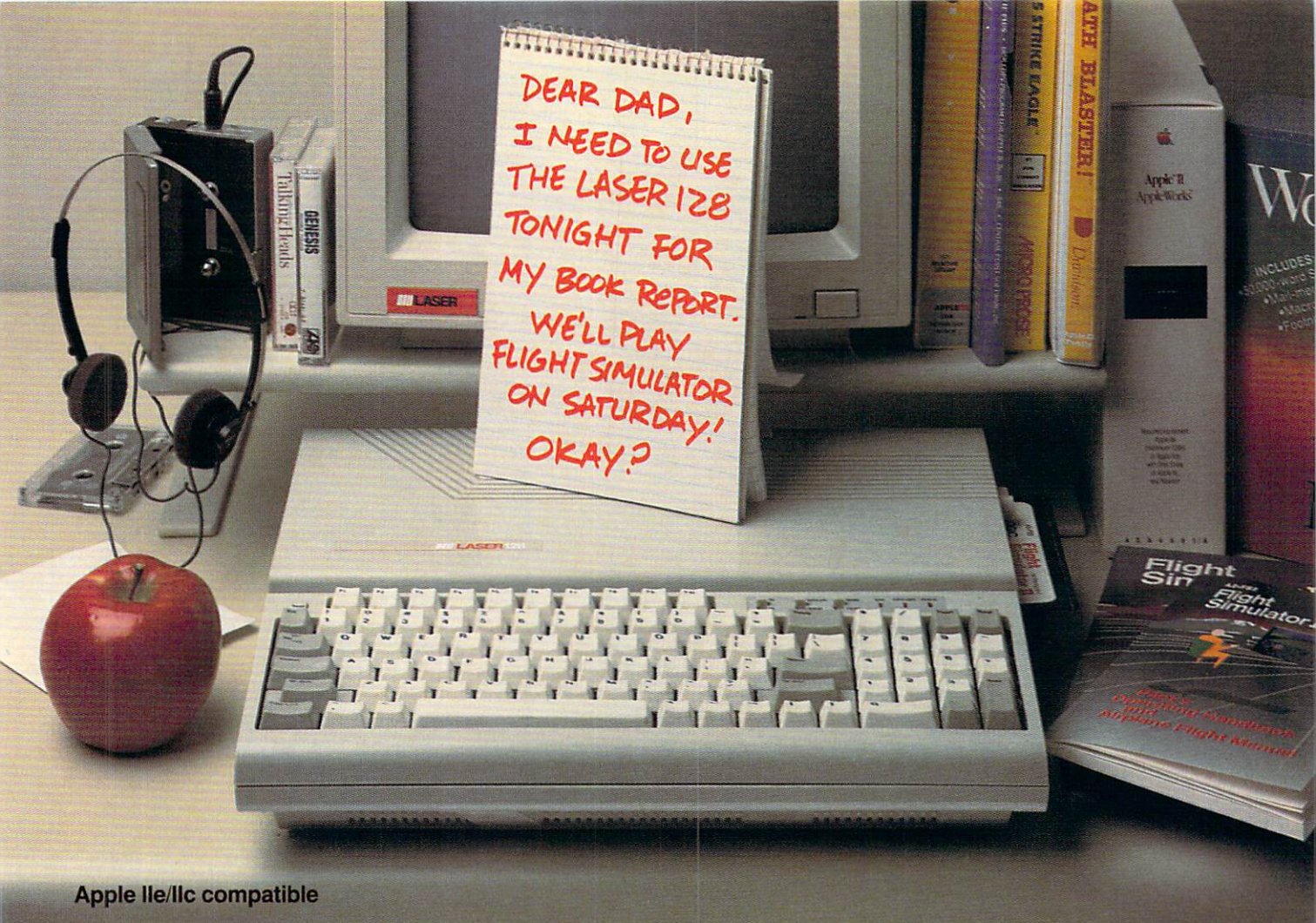
★ *Math Busters* is a surefire way to help your children relieve their fear of math monsters. They will pull numbers and operations from the on-screen environment to build the equations that rid the world of math monsters. This graphic program develops and refines the four fundamental math skills while being entertaining at the same time. For ages 8–14. (\$27–\$30; Apple, C 64/128. Spinnaker Software, One Kendall Square, Cambridge, MA 02139; [617] 494-1200.)

★ *Success with Math* is a series of tutorials for addition, subtraction, multiplication, division, fractions, and decimals. Each program acts as a private tutor by taking the child through the problem, pointing out errors as they occur, and helping to correct them. The step-by-step format improves your child's skills in problem solving. And once you've set the skill level, the math problems are generated randomly. The series includes *Success with Math: Addition with Carry*, for ages 6–9, \$20; *Success with Math: Subtraction*, for ages 7–10, \$20; *Success with Math: 1-2-3 Digit Multiplication*, for ages 8–12, \$20; *Success with Math: Long Division*, for ages 6–14, \$20; *Success with Math: Order of Operations*, for ages 9–14, \$30; *Success with Math: Decimals Series*, for ages 10–14, \$30; and *Success with Math: Fractions Series*, for ages 10–14, \$30. (Apple, Atari, C 64/128, IBM PC and compatibles. Mindscape, 3444 Dundee Road, Northbrook, IL 60062; [312] 480-7667.)



Math Shop

★ *Math Shop* puts your kids to work as store clerks. Each store has a theme based on a math concept. Children fill customers' orders by successfully solving problems in 15 different concepts, including the basic mathematical operations, mea-



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The Laser 128 with all its features: built-in disk drive; 128K RAM (expandable to 1 megabyte); serial, parallel, modem and mouse interfaces; 80 column text mode; numeric keypad; and an expansion slot; makes for a pretty educated buy. When you do your homework on which computer to buy, you'll find the Laser 128 at the head of the class with value. For more information on the Laser 128 and the name of your nearest dealer, contact Video Technology Computers, Inc., 400 Anthony Trail, Northbrook, IL 60062, or call (312) 272-6760.



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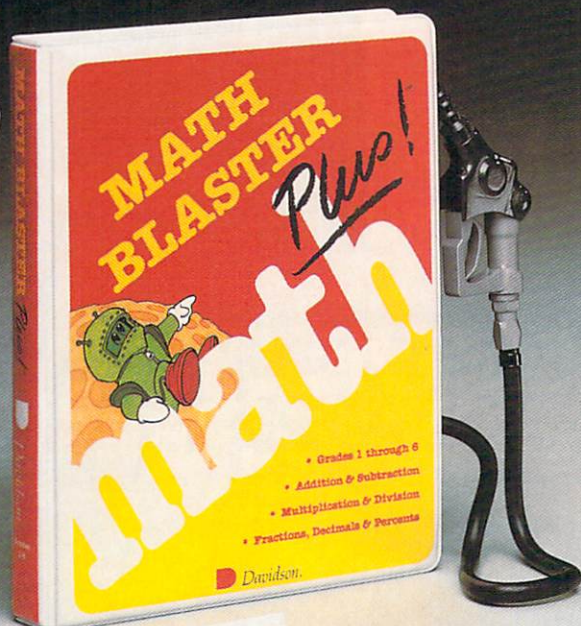
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CIRCLE READER SERVICE 10

HOME-SCHOOL CONNECTION

surements, equalities, inequalities, factors, decimals, fractions, proportions, and more. For ages 8–14. (\$40; 64K Apple II series, Apple IIGS, C 64/128, 256K IBM PC and compatibles. Scholastic Software, 730 Broadway, New York, NY 10003; [212] 505-3000.)

LEARN MATH ARCADE-STYLE

Youngsters keep pumping quarters into game machines, and software publishers keep searching for the magic formula that will have the kids coming back to practice math skills. Here are some of the best of that genre:

★ *Donald Duck's Playground* is a change-making program. Children work at different jobs earning the money needed to help Donald Duck build a playground for Huey, Dewey, and Louie. While managing a produce stand, stocking toy store shelves, sorting cargo, operating the Amquack Railroad, or designing and constructing the playground, kids hone their skills in shape recognition, matching, logic, and money handling. For ages 7–11. (\$25–\$30; Amiga, 64K Apple, Atari, C 64/128, IBM PC and compatibles. Sierra On-Line, P.O. Box 485, Coarsegold, CA 93614; [209] 683-4468.)

★ *The First Men in the Moon Math* is a game that focuses on addition, subtraction, multiplication, and division word problems. But in order to get to the word problems, children have to fuel Professor Cavor's spaceship by correctly solving a selection of math equations. Once the professor is on the moon, they start to explore the underground caverns, and the word problems appear. For ages 9–12. (\$25–\$40; Apple, C 64/128. Fisher-Price/Spinnaker [see page 20].)

Learning math on the computer can be fun for youngsters and it can also help them get additional practice or a head start in mastering new concepts. Some concepts are best introduced through visuals, and that's where the computer and good software can offer unique tutoring. With your supervision and the right math programs, your kids will conquer basic skills and be ready to move on to algebra, geometry, and trigonometry. ■

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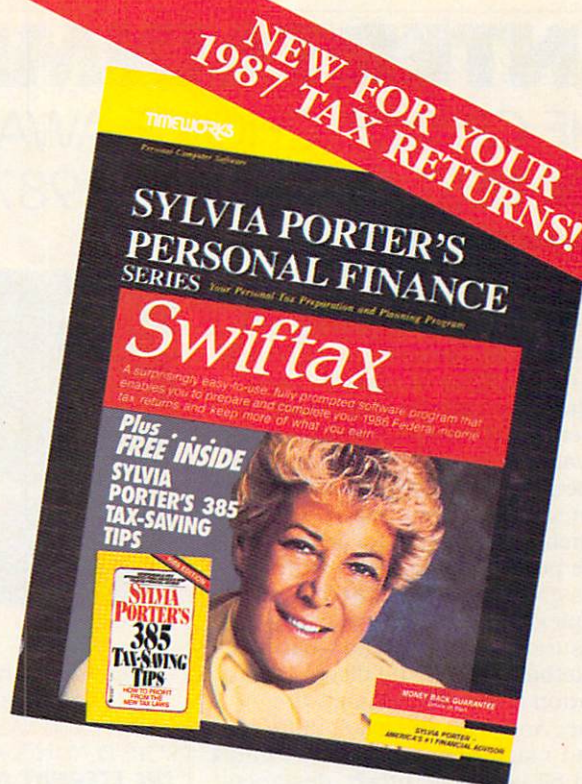
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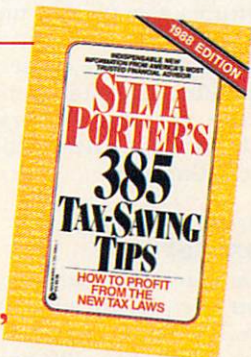
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ENTERTAINMENT

THE CRITICS' CHOICE AWARDS FOR BEST GAMES OF 1987

BY JAMES DELSON

It was a year of twists, turns, and shake-ups in the software entertainment field: Sales of entertainment programs surged by more than 50 percent; IBM owners applauded the arrival of more MS-DOS games and reveled in the wealth of entertainment software from which they had to choose; and with the advent of more powerful machines, simulations grew in sophistication and complexity. More accurate simulations in the sports arena—baseball, basketball, flying, and driving, just to mention a few—dominated the scene. And with the availability of 32-bit machines, such as the Amiga, Atari ST, and Macintosh, designers started pushing memory and graphics capabilities to the limit. For example, in *Earl Weaver Baseball*, players can make strategy choices: they can hit and run, double steal, or play the infield in to cut off runners at the plate. Role-playing adventures give players more game time; some programs run 400 hours.

Looking back, we chose last year's outstanding four-star games. And here they are, the winners of our fourth annual Critics' Choice Awards for Best Games!

GAME OF THE YEAR **STARFLIGHT**

This year's best game is a combination role-playing adventure/space opera. It's a multidisk extravaganza that requires 200–400 hours to complete and taxes your mental resources to the limit. You'll learn to navigate a starship; hire, train, and, sometimes, fire crew members; engage in intergalactic trade (also known as piracy); explore uncharted regions of space; mine precious commodities; fight battles; build and modify spacecraft; win friends; and influence beings who regard you as little more than space dust. It's exciting, believable, mentally and physically exhausting, and well worth the effort, though it may take weeks or even months to complete.

JAMES DELSON has been reviewing entertainment software for FAMILY & HOME-OFFICE COMPUTING since our first issue.



Starflight

Electronic Arts, (415) 571-7171.
256K IBM PC and compatibles. \$50.

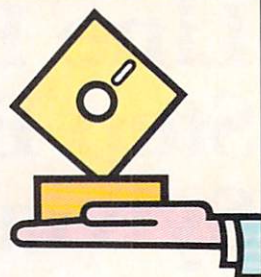
ROLE-PLAYING ADVENTURE **THE ETERNAL DAGGER**

The Eternal Dagger is the sequel to *Wizard's Crown*, last year's winner in the same category. Using your own heroes from the previous game, characters provided by the designers, or new characters created from scratch, you must undertake a quest that sends you to dangerous lands. There you meet and conquer a wide range of monsters. The incredibly detailed play system allows you to control up to eight characters, each a master of up to 30 weapons, 27 skills, and 22 spells and wearer of 15 types of armor. All this takes about 200–300 hours to complete, but the game can be played one chapter at a time, so you can derive satisfaction from finishing tasks on your way to winning the entire game.

Strategic Simulations, Inc., (415) 964-1353. Apple, Atari, C 64/128. \$40.

ORIGINAL FORMAT **ROBOT RASCALS**

Few games designed for computers are truly original. Most are based on coin-op games, board games, card games, sports games, or other computer games. But *Robot Rascals*, designed by Ozark Softscape, designer of *M.U.L.E.* and *Seven Cities of Gold*, is unique. Two to four players take turns in this scavenger hunt, trying to locate and gather specific objects that have been scattered across the terrain of another planet. Using robots (each with its own special quirks), you search for the objects, steal from other players, and



alter the course of play with cards. There's a built-in handicapping system to balance age and experience levels.

Electronic Arts, (415) 571-7171.
64K Apple, C 64/128, 256K IBM PC and compatibles. \$40–\$45.

STRATEGY AND TACTICS **REBEL CHARGE AT CHICKAMAUGA**

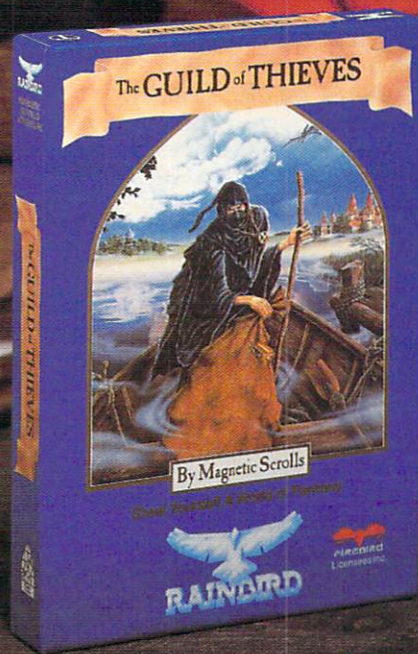
Building on its great American Civil War series, Strategic Simulations has released a third installment. On the heels of *The Battle of Antietam* and *Gettysburg: The Turning Point*, this new game has an improved play system, including new features such as zoom (allowing players to see the whole battlefield or a close-up), a handicapping system, and bonuses for successful attacks and maneuvers. With its complex play system, *Rebel Charge at Chickamauga* is the high water mark of computer strategy and tactics gaming to date.

Strategic Simulations, Inc., (415) 964-1353. 64K Apple, Atari, C 64/128, 256K IBM PC and compatibles. \$50.

TEXT ADVENTURE **BUREAUCRACY**

If you're not troubled by computer games that mislead, trick, and even lie, this is the entertainment choice for you. In his new game, Douglas Adams (of *Hitchhiker's Guide to the Galaxy* fame) challenges you to triumph over an incredibly fouled-up situation. Sometimes frustrating, usually amusing, and incredibly intricate, this game sends you on a bureaucratic runaround. The predicaments are unbearable, but highly laughable. The puzzles range from easy to mind boggling, but they're sometimes unfair: Seemingly promising clues can lure you into a dead end where you'll be stuck for hours. Just gather a few resourceful friends and use a hint book (you'll have to buy it separately) so you don't tear out all your hair.

Infocom, (617) 492-6000. Amiga, 128K Apple, Atari ST, C 128, IBM PC and compatibles, Macintosh. \$35–\$40.



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GUILD OF THIEVES is the long-awaited sequel to THE PAWN, which came sizzling onto the software scene to awards and accolades. Both are available now from Firebird.

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GUILD OF THIEVES and PAWN, Computer Entertainment Adventure of the Year, come to you from Firebird, publishers of world-famous leading edge games under the Rainbird label.

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Available for C-64, Amiga, Atari 520ST, Atari 800/130, MacIntosh, IBM and compatibles. A "text-only" version is available for Apple II computers at \$39.95.

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CIRCLE READER SERVICE 15

ENTERTAINMENT

SPORTS STRATEGY

Tied: **GRIDIRON!** and **EARL WEAVER BASEBALL**

Here's a tie between two sports-strategy games that tax your intellect as well as your eye-hand coordination. Both offer a variety of options; players who lack arcade skills can make decisions without "getting their hands dirty" on the playing field, and players with developed coordination can hit or pass, steal and punt, and run and pitch to their hearts' content. Both games have handicapping potentials for players with differing ability levels, allow you to update team stats, and offer superb sound and graphics.

Gridiron!, Bethesda Softworks/Electronic Arts, (415) 571-7171. Amiga, Atari ST, \$50-\$60. *Earl Weaver Baseball*, Electronic Arts, (415) 571-7171. Amiga, 256K IBM PC and compatibles, \$40-\$50.

SPORTS ARCADE

GBA CHAMPIONSHIP BASKETBALL TWO-ON-TWO

For a long time, it looked as if nothing would ever top *Larry Bird and Julius Erving Go One-on-One* as the best basketball simulation around. But *Two-on-Two* succeeded where others failed by offering such new features as team play (you and a pal against a two-man computer team), seasons instead of single games only, plus state-of-the-art graphics, sound, and play system. The game is tough to learn, tough to



GBA Championship Basketball Two-On-Two

beat, and nearly impossible to quit playing once you've learned the right moves. Games run up to 60 minutes—that is, if your joystick hand can hold out!

Gamestar/Activision, (415) 960-0410. Amiga, 128K Apple, Atari ST, C 64/128, IBM PC and compatibles, \$35-\$40.

GRAPHIC ADVENTURE

DEFENDER OF THE CROWN

Computers with enhanced graphics capabilities—such as the Amiga, Apple IIGS, and Atari ST—allow designers to create visual images eclipsing all previous efforts. The winner in this category contains images that evoke the feel of such classic films as *The Adventures of Robin Hood* and *Knights of the Round Table*. *Defender of the Crown* is an adventure war game set in the Middle Ages. The goal is to become King of England, fighting and plotting against a host of characters fashioned after Norman and Saxon nobility in the time of Robin Hood and Ivanhoe. The game's play system is so-so, but the graphics are brilliantly detailed: There are flickering torches that line the walls, vast staircases where hero fights foe, and gorgeous tournament grounds where you joust for fun and profit.

Cinemaware/Mindscape, (312) 480-7667. Amiga, Atari ST, C 64/128, 256K IBM PC and compatibles, \$35-\$50.

SIMULATION

CHUCK YEAGER'S ADVANCED FLIGHT TRAINER

Continuing its celebrity series of computer entertainment, Electronic Arts enlisted Air Force General Chuck Yeager, one of America's most popular heroes (canonized in *The Right Stuff*), to help design this state-of-the-art flight simulator. This game has 14 different aircraft and coaches you in basic flying skills, advanced maneuvers, and acrobatic stunts. Each plane's instrumentation is different, and most have a wide array of options that give a distinctive "feel" to the aircraft. Other features include instant replays of maneuvers, views of your plane in flight, and much, much more. Combine that with 3-D scrolling graphics and a tutorial and you have the most exciting flight simulation we have ever encountered.

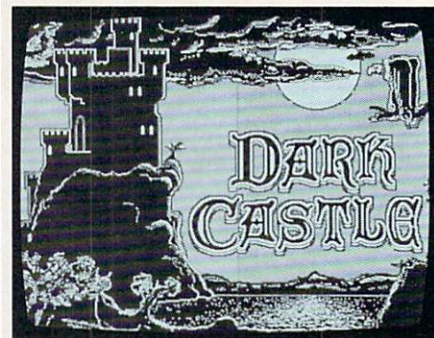
Electronic Arts, (415) 571-7171. C 64/128, 256K IBM PC and compatibles, \$35-\$40.

ARCADE SHOOT-'EM-UP

Tied: **ALIENS: THE COMPUTER GAME** and **DARK CASTLE**

This year's arcade shoot-'em-up award is shared by two different types of adventure games: In *Aliens: The Computer Game*, your goal is to

escape from extraterrestrial life-forms, and in *Dark Castle* you must enter a fortress and defeat the sinister Black Knight. Both require excellent eye-hand coordination, mapping ability, and problem solving. The games also feature excellent graphics



Dark Castle

and sound that don't bore players even play after play. *Aliens: The Computer Game*, based on the hit film, is divided into chapters, which are separate minigames, while *Dark Castle* is more of a traditional multi-screen game, with your character jumping, running, ducking, and fighting his way through a multileveled dungeon.

Aliens: The Computer Game, Activision, (415) 960-0410. 128K Apple, C 64/128, \$35. *Dark Castle*, Silicon Beach Software, (619) 695-6956. Macintosh, \$50. *Dark Castle*, Three-Sixty, (408) 879-9144. Amiga, Atari ST, C 64/128, 256K IBM PC and compatibles, \$35-\$45.

ARCADE

MARBLE MADNESS

This long-awaited computer translation of the classic coin-op arcade game is everything we hoped it would be. All the thrills, action, excitement, and fun of the original remain intact, and the graphics (especially on enhanced graphics machines) are amazingly detailed. Players maneuver marbles through a highly complex maze, avoiding traps and pitfalls while coasting up and down ramps, taking shortcuts—such as hidden chutes and tunnels—and even surfing the electronic waves to save a little extra time. Although newcomers may be wiped out in a few minutes, proficient players can keep rolling for an hour.

Electronic Arts, (415) 571-7171. Amiga, 128K Apple, Atari ST, C 64/128, 256K IBM PC and compatibles, \$30-\$50. ■

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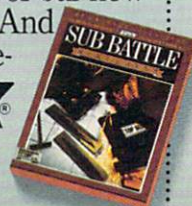
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MACHINE SPECIFICS

NEWS, OPINIONS,
QUOTES, AND RUMORS ABOUT
YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

APPLE II

Happy New Year! In 1988, we're going to double our coverage of Apple computers, so we can bring you more news on *both* the II line and Macintosh line every month. Both lines have machines with large installed bases and are so different they cannot be easily grouped under one umbrella.

Printer Problems. I receive many questions about printers. Readers ask: What kind of printer should I buy? Why is my printer producing such strange characters? How do I get a screen dump?

These days, my favorite Apple II printer is the ImageWriter II. It's a fast, rugged, attractive unit with high-quality print and color capabilities and a serial connector. However, some older programs, written to work with the IIe and IIc, may not be able to print properly with the IIgs serial interface. Call Apple to check on the availability of an updated version of the software.

If you have an Apple II, IIe, or II Plus, the standard interfaces are Orange Micro's ProGrappler (parallel, \$119) or Serial Grappler Plus (serial, \$89) or the Apple Super Serial card (\$139). The ProGrappler offers screen dumps and excellent graphics control.

If you want a parallel printer for a IIc, IIgs, or Macintosh, use Orange Micro's Grappler (\$99), a serial-to-parallel converter.

Control Codes. Once the computer and printer are properly connected, you must utilize the printer's built-in features to enhance your documents (boldface, underlining, or near-letter-quality type, for instance). This is accomplished in two ways.

First, you can set your printer to begin printing automatically in the size and style you use most often. Usually, this can be done by setting the proper switches or pressing the

appropriate front-panel buttons; read your printer manual to determine the correct settings.

The second method is through software control. The software sends the printer "control codes" (via special characters such as CONTROL-U or CONTROL-B or sequences such as ESCAPE-1 or ESCAPE-A) that initiate or cancel specified printing features.

At this stage, strange things can happen. For example, with anything except an Apple Parallel card, early versions of *AppleWorks* printed "I80N" at the top of each document.

If your program uses "decimal code entry" (the entering of a substitute number for an ASCII character, for example, 001 for control-A), try adding 128 to the code. Also, some printers will cancel certain print modes at the end of a line, so you may have to turn on the mode several times to produce that effect in a multiline paragraph.

MACINTOSH

The power and speed of the Macintosh have clearly inspired a fresh outpouring of powerful software.

In the area of desktop publishing, the latest versions of Aldus's *PageMaker* (\$695), Letraset's *Ready Set Go!* (\$495), and Quark's *XPress* (\$695) all have impressive capabilities, and choosing among them is difficult indeed. *PageMaker 2.0* has a large user base and cross-compatibility with the MS-DOS environment; *Ready Set Go! 4* is especially slick at handling text formatting; and *XPress* shines when it comes to wrapping text around graphics.

Performing database functions is the most complex and difficult of the basic computer applications, but *4TH Dimension* (Acius; \$695) takes advantage of the Macintosh interface to make solving difficult tasks significantly more simple and straightforward.

New Laser Printer. General Computer, manufacturer of the HyperDrive hard-disk drive, has introduced its Personal LaserPrinter (\$2,599). The PLP is smaller and considerably less expensive than an

Apple LaserWriter and can generate comparable quality with only a small sacrifice in printing speed.

PLP's price is low partly because it utilizes the Mac's own *QuickDraw* graphics routines to produce text and graphics instead of the PostScript page-description language, which most Mac desktop-publishing programs support.

The printer requires its own font sets (it comes with six) and is not completely compatible with all software. The PLP, for instance, will work with PostScript programs, but won't deliver the range of typesets.

Modern Jazz. Lotus's sequel to *Jazz* is *Modern Jazz*, a multifunction program with six different modules. *Modern Jazz* has macros and a command language so that you can customize it. All *Jazz* files work with *Modern Jazz*, which will ship in the first quarter of this year, according to Lotus.

CHARLES H. GAJEWAY can be reached on CompuServe (ID: 73357.3577) or on GEnie (ID: C GAJEWAY).

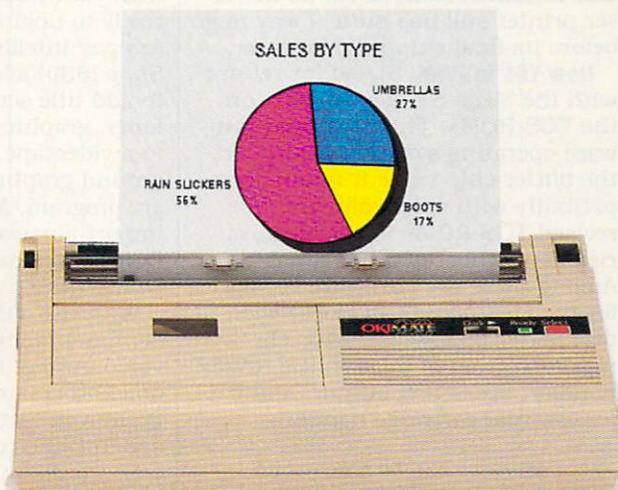
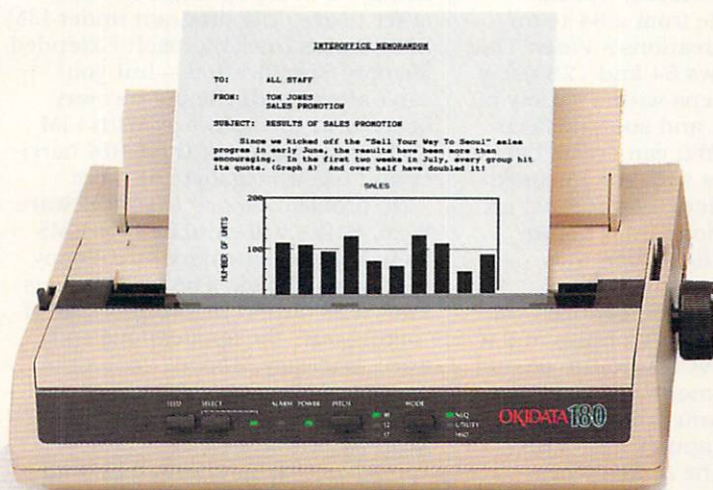
ATARI

BY JOHN J. ANDERSON

Atari, in a dramatic move to improve the distribution of its machines, purchased the Federated Group Inc.'s troubled 65-store retail electronics chain throughout California, Arizona, Texas, Kansas, and New Mexico. The deal cost Atari in excess of \$65 million. Jack Tramiel, Atari's colorful chairman, was quoted as saying, "Our Japanese counterparts all have their own stores in Japan. I like to copy success."

Do You Believe in Magic? Our operative in Michigan came back from MAGIC (Michigan Atari General Information Conference) in Detroit with much to report. Among other things, the new Atari CPU was presented there: the 520STFM. This is a 520ST with an integral single-sided floppy drive (instead of the current external drive), very similar in its styling to the 1040ST. It's in

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CIRCLE READER SERVICE 25

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MACHINE SPECIFICS

the stores now and is very competitively priced. A 520STFM without monochrome monitor will cost about \$600.

The Elusive Laser. The Atari laser printer—expected to be out by the end of 1987—was on display at the show. The demonstration unit was turning out very good-looking fliers, as opposed to its last public appearance, when it wasn't working at all. Our informed sources tell us the laser printer still has quite a way to go before its final shipping, however.

New TOS in ROM. Slated for release with the Mega ST is an update on the TOS ROMs. This improved firmware operating system will support the blitter chip while it retains compatibility with older software. The revised TOS ROMs in the Mega series have a host of other capabilities. Among these are hardware support for the Mega's built-in clock/calendar; better floppy-disk error-checking; correction of bugs in the RS232 handler; faster text output; and better external cartridge handling.

JOHN J. ANDERSON can be reached on CompuServe (ID: 76703,654).

COMMODORE

BY SHAY ADDAMS

First announced last spring, the Amiga 2000 officially shipped in September with a \$1,995 price tag (plus \$399 for an Amiga monitor). Like the Amiga 500 and 1000, the 2000 is capable of multitasking, which means you can run several programs at once in different windows. The number of programs you can run simultaneously depends on the amount of RAM and the size of the programs.

The 2000 boasts nine slots for boards—five Amiga slots and four IBM PC XT slots. The BridgeBoard (\$499; \$699 with MS-DOS disk drive), which enables you to run MS-DOS software, takes up one Amiga and one XT slot. You can even cut data from an Amiga program and paste it into an IBM file, or vice versa. Hard-disk controllers, digitizers, co-processors, and a genlock device for overlaying graphics on a videotape can also be integrated into the unit.

Bard's Tale. I've seen some superb Amiga games, especially *Phantasie*

III (SSI) and *Bard's Tale* (Electronic Arts). Both unfurl such lush graphics that I was almost compelled to play them through to the end, even though I finished the original versions months ago. (Bad news for *Bard* fans, however: *Bard's Tale III* is being written for the Apple IIGS first, not the C 64.)

VCR—Computer Creations. Want to try combining computer graphics with your home videos, but not ready to upgrade from a 64 to an Amiga? IntelliCreations's *Video Title Shop* (\$30) allows 64 and 128 users to add title screens with a variety of fonts, graphics, and special effects to a videotape. You can create background graphics with the included art program, *Micropainter Plus*, or import illustrations from *Koala Painter*, *Micro Illustrator*, and *QuickDraw*.

With two VCRs, you can feed your computer-generated graphics and a video from one VCR into the second one and create montages. The program won't let you pull a video image into the computer for editing, as you can do on the Amiga with *Deluxe Video*.

Diagrams in the 48-page manual illustrate how to attach a VCR to the 64 or 128. The *Video Title Shop: Graphics Companion I* (\$20) has 25 ready-to-load pieces of art (and five border patterns) for birthdays, holidays, and other family occasions.

SHAY ADDAMS, editor and publisher of *Questbusters*, an adventure-game newsletter, can be reached on CompuServe (ID: 72267,601) or on QuantumLink (ID: JBCALMER).

IBM

BY HENRY BEECHHOLD

Perhaps stung by comments suggesting that colleges would snub a computer system aimed at K-12 folk, IBM has announced the PS/2 Model 25 Collegiate. It comes with 640K, a second 3.5-inch disk drive, and the *Collegiate Kit*—a start-up package consisting of IBM PC DOS 3.3, PS/2 Mouse, Microsoft Windows (with word processing, graphics, and file-management programs), an interactive tutorial program, and four blank disks.

Student—Faculty Discounts. The Collegiate will be available to students,

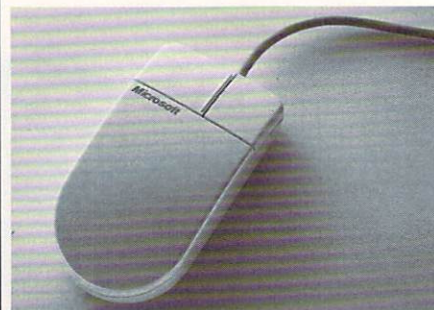
faculty, and staff at a special educational discount, which can be arranged through campus representatives called Education Product Coordinators, as well as through IBM dealers designated by the company as Certified Education Specialists.

Faking It. Suppose you've decided that it's time to vamp up your home-office operation a notch or two by using *1-2-3*, *Symphony*, or some other heavy-duty program under LIM EMS (Lotus/Intel/Microsoft Extended Memory Specification)—but you can't afford both the big memory board and the software. With LIM EMS, you can break the 640K barrier and use a megabyte or more.

No problem. *Above Disc* (Teleware West, \$100) will emulate LIM EMS by using extra memory on a floppy disk or hard disk. The technique is known as *virtual memory*, a way of "faking out" the applications software. Basically, *Above Disc* works by swapping chunks of data back and forth between a storage area and memory. Thus the size of, say, a spreadsheet is not limited by your machine's RAM.

Of course, when you try to save the spreadsheet, you'll be limited by your disk storage size, which is why a hard disk is the ideal medium for *Above Disc*. And accessing a floppy disk is not nearly as fast as accessing RAM.

HENRY BEECHHOLD is the author of *The Brady Guide to Microcomputer Troubleshooting & Maintenance* (Brady Books, Prentice Hall Press, New York).



The sporty Microsoft Mouse

MS-DOS

BY STEVE MORGENSTERN

There's a new mouse from a big cheese in the business, and it looks like a winner. Microsoft has completely redesigned its functional but

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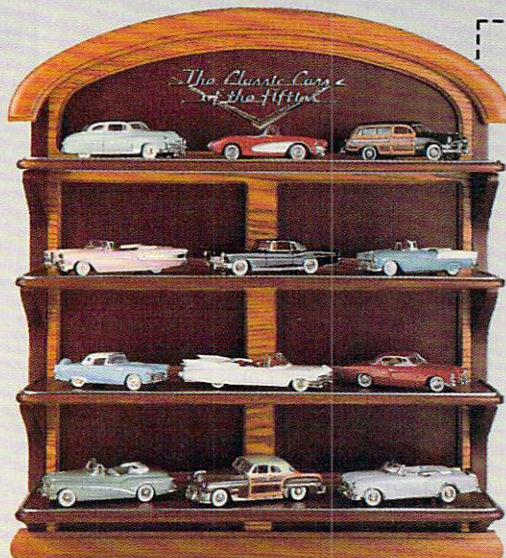
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MACHINE SPECIFICS

clunky rodent. The new Microsoft Mouse looks and handles like an Italian sports car. Designers moved the rolling ball forward to provide quicker response and lengthened the mouse's "tail" considerably to make the unit much more convenient on cluttered desktops.

There are three models—a serial mouse, a bus mouse (with its own interface card), and a PS/2 mouse. You can buy any one bundled with *Microsoft Paintbrush* and *Microsoft Menu* (\$150), with *PC Paintbrush* for *Microsoft Windows* (\$200), or with *EasyCAD* (\$175).

Painting Windows. ZSoft Corporation has announced new versions of two highly regarded graphics programs that now run under *Microsoft Windows*. *PC Paintbrush* for *Microsoft Windows* (\$84) and *PC Paintbrush Plus* for *Microsoft Windows* (\$139) are compatible with any color or monochrome graphics mode supported by *Windows* and simplify cutting and pasting *PC Paintbrush* images with other *Windows* applications. *Paintbrush Plus* adds support for scanners to the basic full-featured freehand drawing package.

STEVE MORGENSTERN can be reached on CompuServe (ID: 72545.606).

TANDY

BY STEPHEN MILLER

Even though they look the same and operate the same, there is a difference between the versions of *Personal Deskmate 2* for the Tandy 1000 HX and TX. The HX version (25-1053) has some instructions in ROM. The TX version (25-1600) is completely on disk. The bottom line is that the two versions are *not* interchangeable. You can't run the HX *Personal Deskmate 2* on a TX, or vice versa.

Most of the hardware options offered on previous models of the Tandy 1000 series will work without modifications on the new 1000 TX. If you upgrade from the SX to the TX, you can simply swap boards. But there are some little things to watch out for. Because earlier models did not come with a serial port, there might be conflicts with COM (communications port). The built-in serial port on the TX is set for COM

1, and a serial device such as an internal modem may have to be set for COM 2. You can change port designations through your communications software. Also, be sure to check the jumpers on the E1 to E4 pins that help control the active COM ports.

OS 9 Help. If you're an experienced OS 9 Level I user and have just moved up to Level II, a good supplement to the Tandy manual is Kevin Darling's *Inside OS 9 Level II* (Frank Hogg Laboratory, Inc., \$40). The book is chock-full of tips, bug fixes, and program listings.

You don't need to type in all the listings in the book, because a supplemental disk (\$20) is available. Frank Hogg deals exclusively with the OS 9 operating system and is a good source of support. You can have your name added to the company's mailing list by writing to: 770 James St., Syracuse, NY 13203.

STEPHEN MILLER is a computer consultant and journalist.

ORPHANS

BY PATRICK SPERA

A reader in Prince George, British Columbia, Canada, asks why we don't cover the Canadian computer market. Good question: What are our northern neighbors doing? A lot, that's what! Especially with the orphans.

Spectravideo and MSX. SYNODA Company provides hardware and software for Spectravideo and MSX computers. Items include MSX graphic tablets (\$99, Canadian), a disk controller (\$85, Canadian), and a printer interface (\$35, Canadian).

Memberships in the Spectravideo/MSX Users' Group (S.M.U.G.) are \$25 (Canadian), and include a monthly newsletter. The newsletter is usually printed in both English and French.

Adam MegaCopy. As the stock of original Digital Data Packs (DDP) for the Adam has dwindled, users have been forced into many different schemes to make copies of DDPs. Enter Trisysd Video Games with MegaCopy (\$60, Canadian), a hardware-software combo that will allow you to make DDP copies with ease.

You'll need two Digital Data Drives, as the hardware is plugged

into the second drive. Then all you need is a modified audiocassette. Drill holes into the write-protect slots similar to the one in a Coleco DDP. I recommend spending the extra bucks and getting high-quality tapes. DDPs have enough trouble as it is; don't add to your woes with cheap tape!

The process of making copies is completely menu-driven. MegaCopy should be a boon to users' groups and dealers with large public-domain databases to distribute.

2068 Disk Interface. Larken Electronics has redesigned its disk controller for the TS 2068. The DOS is now on a card that plugs into the expansion slot. This leaves the RAM free for program use. There's also an additional slot on the controller open for user ROMs and EPROMs, such as a Sinclair Spectrum Emulator.

The disk controller will drive up to four disk drives. Also included as part of the interface is a Kempston joystick port (a must for Spectrum program use!) and an NMI push button. This is used to transfer cassette software to a floppy disk.

And if that's not enough, Larken has included some new Extended BASIC commands for graphics and windows. The price of the interface and DOS cartridge is \$160 (Canadian). If you already have an old Larken interface, the new DOS cartridge will work with it. Also available is a TS 1000/1500/2068 disk controller for \$145 (Canadian).

PATRICK SPERA is *sysop* of the Computer Club Forum on CompuServe (GO CLUB), a meeting place for owners of orphaned computers.

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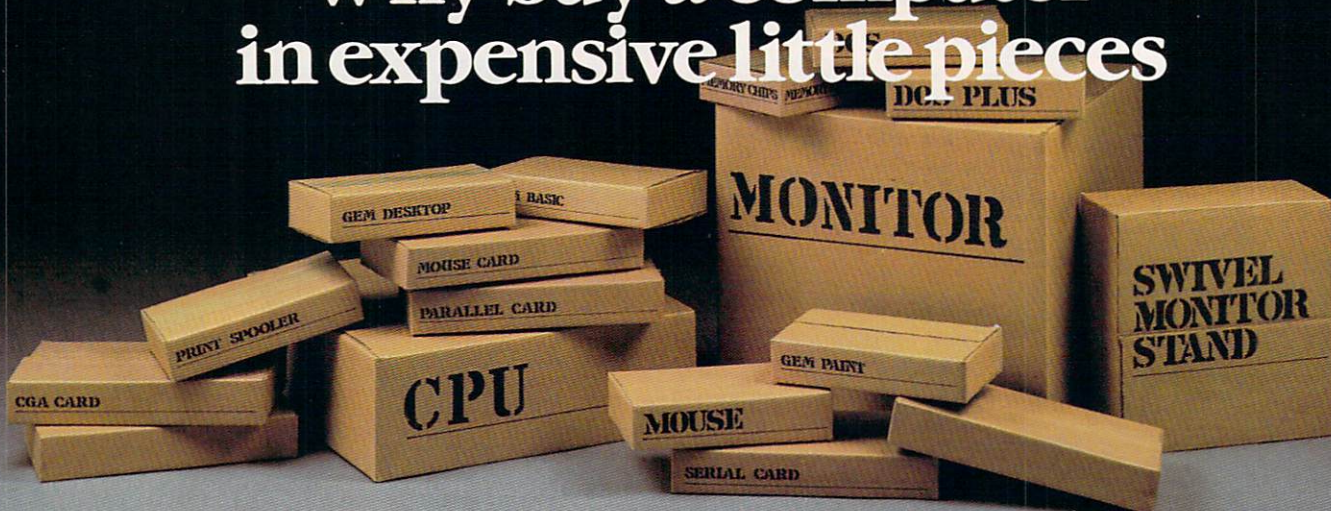
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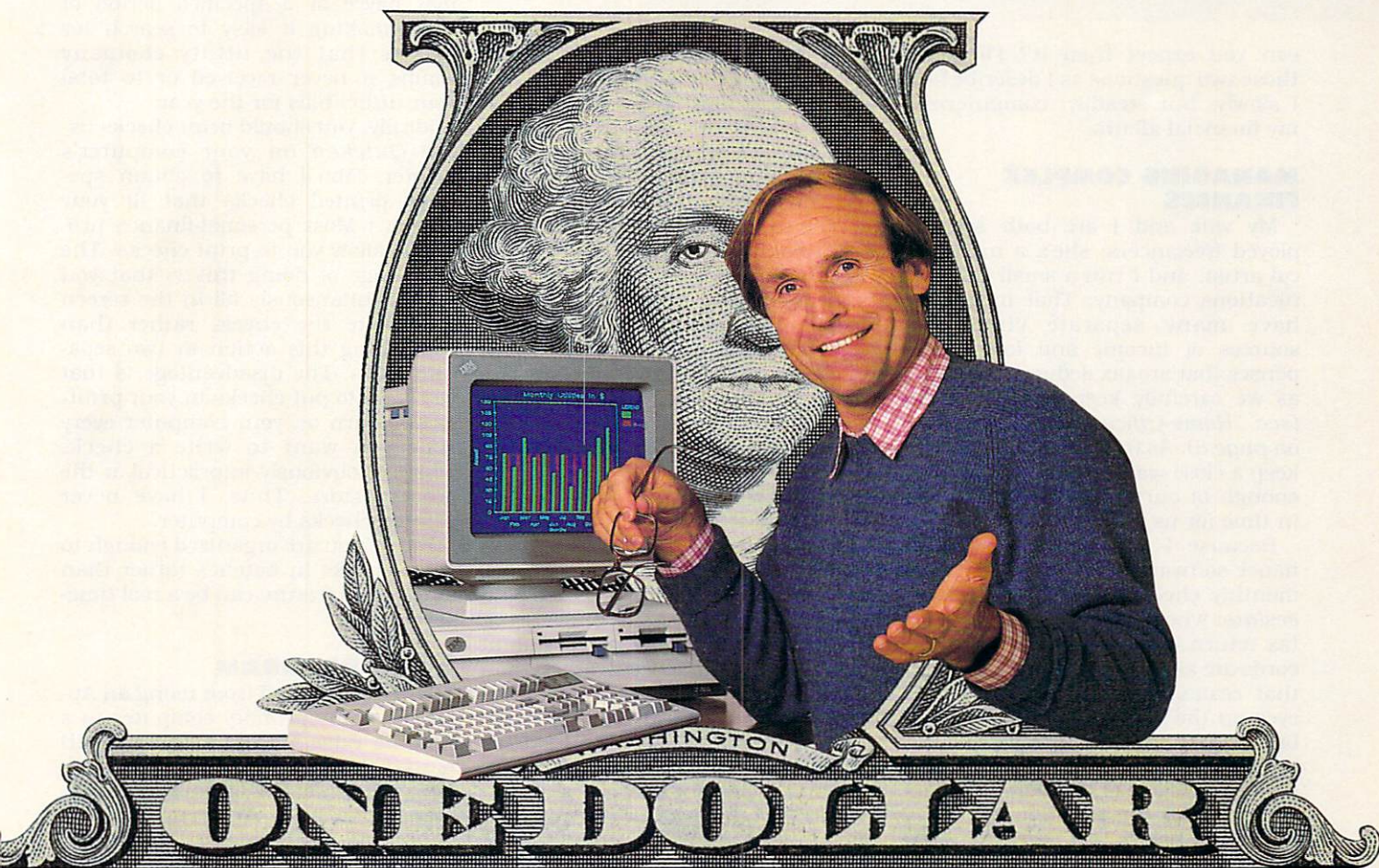
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A Guide to Fiscal Fitness

PAYING CHECKS AND BUDGETING BY COMPUTER
CAN HELP CONTROL YOUR SPENDING

BY STEVE MORGENSTERN

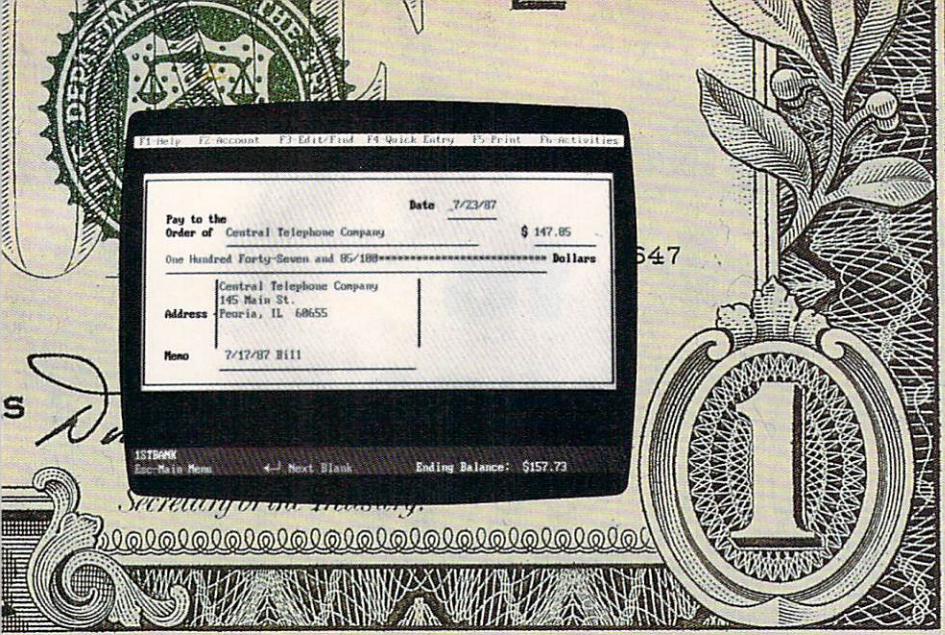


My justification for whipping out the credit card and buying my first computer was word processing, pure and simple. Games, educational software, and computer programming tools quickly followed. It took years,

Contributing editor STEVE MORGENSTERN has used his computer to keep fiscally fit for more than three years.

though, before I seriously considered managing the family fortune by computer, and even then the first attempts were brief enthusiasms that quickly fizzled. I'm sure I'm not alone in this department. How many of you have an attractive software box—that promises it will whip your financial life into shape—resting dusty and unused on a shelf?

Finally, after several false starts, I triumphed. Today the computer is an integral part of our money management, used to track checking accounts, set budgets, and prepare long-term financial projections. I heartily recommend such a system to many of you—though certainly not everybody. Who's suited to computerized financial management? What



Quicken is a well-constructed checkbook-organizer and checkbook program with ready access to past-transaction records.

paper. You use the "memo" line to assign spending to expense categories. If you want to keep track of your medical expenses, for example, every time you pay a doctor bill, you enter "medical" on the memo line. Then, when you want to generate a report summarizing all your medical expenses, you simply ask the program to retrieve all the transactions in the "medical" category.

By deciding on standardized memo phrases, you can produce meaningful reports whenever you want. You can also search your records for a particular payee or a specified period of time, making it easy to search for checks that the utility company claims it never received or to total your utility bills for the year.

Ideally, you should print checks using *Quicken* on your computer's printer. (You'll have to obtain specially printed checks that fit your printer.) Most personal-finance programs allow you to print checks. The advantage of doing this is that you can simultaneously fill in the screen and write the check, rather than completing this action in two separate steps. The disadvantage is that you have to put checks in your printer and turn on your computer every time you want to write a check, which is obviously impractical at the grocery store. Thus, I have never printed checks by computer.

But, if you are organized enough to write checks in batches rather than singly, this feature can be a real time-saver.

A NEW PROGRAM

When I switched from using an Apple IIc as my primary computer to a Leading Edge Model D with a 20MB hard-disk drive, I also changed to a more complete financial-management package—*Andrew Tobias' Managing Your Money* (MECA). In fact, this program is so complete that I completely ignore many of its features. It includes a reasonably sophisticated section for managing your investment portfolio, for example, and a slick little card file for keeping track of names, addresses, and reminders of important dates.

My portfolio could fit on the head of a pin, and I already have plenty of software to remind me not to forget my niece's birthday. However, the core money-management functions

can you expect from it? I'll tackle those two questions as I describe how I slowly, but steadily, computerized my financial affairs.

MANAGING COMPLEX FINANCES

My wife and I are both self-employed freelancers; she's a mechanical artist, and I run a small communications company. That means we have many separate clients as sources of income and lots of expenses that are tax deductible as long as we carefully keep track of them (see "Home-Office Tax Deductions" on page 8). As freelancers, we have to keep a close watch on cash flow—will enough of our clients pay their bills in time for us to pay ours?

Because I am using personal-finance software, I breeze through the monthly checkbook balancing. I am *ecstatic* when I can face preparing a tax return knowing that all of my records are already organized. Granted, that ecstasy fades as soon as I set eyes on the 1040 form, but it's still better than having to start assembling my records from scratch. Being organized is one of the prime benefits of computerizing your finances.

My situation is just one example of someone with multiple sources of income and various deductible expenses. If you have investments, own rental property, or have other sources of income beyond a regular paycheck, you'll find a computer can be an important tool for keeping a finger on your financial pulse and producing complete reports when needed. And anyone who itemizes deductions on a tax form is a prime candidate for computerization.

When it comes to computerizing

your finances, the ultimate question is how well it fits with your personal style. I don't have much patience for pencil-and-paper record keeping, even with a pocket calculator handy. The columns snake across the page, and entries are scratched out and re-written to the point of illegibility.

The computer organizes my financial information in a clear and comprehensible way and calculates the results of savings and borrowing activities, allowing me to concentrate on decision making. The tasks are easier if you enjoy working with a computer as I do. If you don't, you'll have a hard time making it work.

A COMPUTERIZED CHECKBOOK

Your checking account is a focal point for money-management software, since most major bills are paid by check. In fact, many budget-conscious computer users make a point of paying bills by check rather than by cash, so that it's easier to track spending at year's end or any other interval. In fact, my wife and I started paying with checks for our major grocery and pharmacy purchases, to better understand what we were really spending in those categories.

I started computerizing my finances with *Quicken* (Intuit), a relatively simple but elegant program that mimics a traditional checkbook register, but adds significant additional features. The purpose of *Quicken* (and the checkbook-management sections of other personal-finance software packages) is to create a computerized database of your financial transactions.

You fill in an on-screen check just as you would write out a check on

Andrew Tobias' *Managing Your Money* is a complete integrated financial-management program that includes sections for check writing and budgeting.

are all fully implemented in this software package. It also has style, thanks to author Tobias, who is known for making financial information interesting and readable. When was the last time you actually enjoyed reading Help screens? This program effectively uses Help screens for most of its instruction.

Many people have found that *Quicken* offers all the money management help they need or want. But I had numerous reasons for switching programs. We have several bank accounts, each of which has to be handled separately when using *Quicken*. *Managing Your Money* lets me work with all of them in a unified way. The program includes a sophisticated system, for allocating income and expenses to specific budget categories, and a useful financial calculator. With the earlier version of *Quicken* I used, I was not able to track income or set budgets, although these capabilities have been added in version 2.0.

Managing Your Money also makes it convenient to keep track of my outstanding billing. When I send out a bill, I enter the information in the program with the client's name, the amount due, and the expected payment period. This lets me print out a handy accounts receivables report to remind me where I stand and when it's time to get on the phone and start pestering slow payers. (If I had a larger business, I would probably need a dedicated accounting package, such as *Peachtree Complete 2: Business Accounting System*.)

Then, on that happy day when the check does arrive, I mark the deposit in the program, and it automatically carries the information I've already entered into my deposit records, marked with the appropriate income category for tax purposes. If I wanted I could even print out invoices directly from *Managing Your Money*, but I prefer to use my own billing format.

TRACKING SPENDING

Armed with this new financial firepower and facing the start of a new year (always the best time to computerize your finances), I set out to answer the nagging question, "Where does all the money go?"

To solve the monthly mystery of the disappearing dough, I started entering each deposit and withdrawal into

the program and updating my computer records as the money dribbled out of my wallet, my checkbook, and my savings account. The program stores the facts, sorts the data into meaningful categories, and serves up a comprehensive picture (in graphic form) of my financial activity on demand.

I became aware that I unknowingly was spending an inconceivable amount of money on magazines every month, so I curtailed that habit. We also learned that we were spending too much on groceries each month; now, with a well-organized once-a-week trip to the supermarket, we spend less for the same amount of food.

A certain amount of willpower is required for the spending study to work—no pain, no gain. Budgeting requires stringent note taking. You have to decide how large your "miscellaneous expenses" category can grow before your budget turns into a meaningless exercise. No one is eager to account for every package of chewing gum purchased, but that level of strictness may not be a bad idea when first establishing a budget. Over a year, total the quarters you spend for daily newspapers or coffee from the office vending machine, the dollars for lottery tickets or videotape rentals, and the other "reflex" purchases and that will probably account for a hefty chunk of your annual spending than you'd imagined.

Most personal-finance software comes with suggested breakdowns for income and expenses (and assets and liabilities) and allows you to personalize it to fit your individual situation. These categories may follow the divisions used for itemizing income

and deductions when preparing tax forms or other groupings appropriate to your needs. Do you want to keep Rover's food and medical expenses separate from the rest of the family's? Do you want to keep a vacation savings category separate from the general savings?

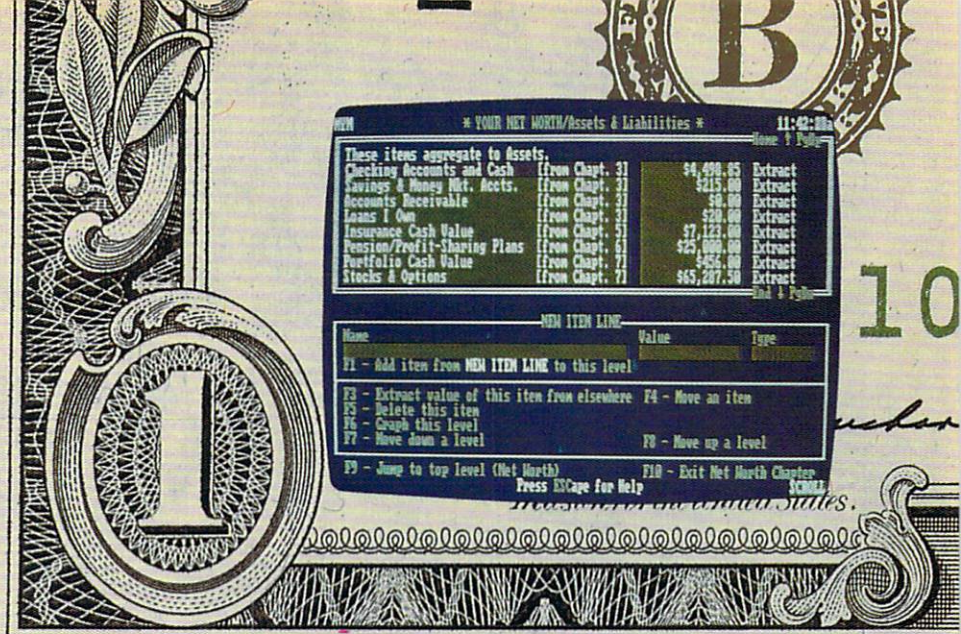
After a few weeks or months (depending on how volatile your income and spending patterns are), you will have an accurate picture of your cash flow. This is the equivalent of weighing in. Now it's time for a financial diet and exercise program—figuring where to cut spending.

SETTING BUDGET GOALS

Most of us want more from our financial software than simply a well-organized depiction of the bad news—we want a tool for improving our lot in life. Once you have developed an accurate picture of your cash flow situation, you can examine the figures and determine where changes would be desirable.

What percentage of your income is allocated to pay the rent, transportation, or insurance? Have your food or clothing expenditures increased or decreased over time? Have they increased faster than your income? Trends that would be difficult to spot by scanning your checkbook become clear and comprehensible when you have your expenses entered in a good personal-finance package. Many budgeting programs will even produce graphs of the information, transforming your monetary activity into pie charts or bar graphs that many people find more meaningful than numbers.

Budgeting is similar to dieting—each time you give up a slab of choco-



SPREADSHEETS AND DATABASES AS MONEY MANAGERS

Do You Really Need Specialized Software?

Even with all its additional features, a personal-finance package is essentially a special-purpose database program. If you already own database software or a spreadsheet program, couldn't you use that instead? The answer is a definite "maybe."

Databases. If you're reasonably adept at using database or spreadsheet software, organizing your personal finances can be an ideal opportunity to put the programs to use. Not all database software is suited for managing your finances, though most can handle the four basic mathematical operations—addition, subtraction, multiplication, and division—required for this purpose. Also, database software won't let you create graphics depicting the figures you enter.

Before I turned to specialized money-management software, I used database software for several years at tax time. Receipts for many relatively small business expenses—postage, cab fare, and so forth—were tossed into everyone's favorite

filing cabinets, a set of shoe boxes. At the end of the year, I set up simple databases for my wife and me and entered each receipt in the order it came out of the box, noting the amount and expense category for each. I did the same for income, entering each project and the amount we were paid. It was then a simple matter for the database software to sort our records chronologically and provide totals and subtotals for each category.

Spreadsheets. For handling an entire family budget, though, spreadsheet software is more appropriate than a database package. Any good spreadsheet can handle whatever mathematical demands you are likely to dish out and will often include sophisticated graphing capabilities as well.

Of course, handling the family finances with a spreadsheet program requires more than knowledge about using a spreadsheet—you must understand the categorization and transaction processes required for successful budgeting as well. If your budgeting needs are relatively com-

plex, you may also need to know the proper formula to accomplish financial calculations for future value of investments, interest paid and received, and so on. These formulas are built into a good money-management software package.

Templates. One way around this problem is to use a template or set of templates for your spreadsheet. A template is a professionally prepared worksheet, fully set up with formulas in place and labeled spaces for you to enter your figures. You can customize the original template if necessary, and it will generally cost less than purchasing a complete money-management program.

Spreadsheet enthusiasts should also remember that some financial management programs will export data directly into a worksheet. For example, the Apple version of *Quicken 2.0* will automatically transfer figures into an *AppleWorks* spreadsheet, and you can make the IBM version compatible with *1-2-3* and *Symphony* when you use *Quicken's* \$20 *Transfer Utility*.

PERSONAL FINANCE SOFTWARE

Andrew Tobias' *Managing Your Money*

This package is a complete integrated financial-management program presented in a friendly manner. It includes sections for budgeting, check writing, transaction tracking, insurance, real estate, stocks, tax estimation, and financial analysis. The package prints graphics and charts and offers more features than many people need; the basic functions are easy to use, and others are available if and when you need them. The IBM version connects to Chase Manhattan's home-banking service. Owners can subscribe to a regular newsletter written by author Tobias. The new version has 1987 tax code instructions.

MECA Ventures, Inc. ([203] 226-2400). 128K Apple with two disk drives, \$150; IBM PC, \$220.

Dollars and Sense

An extremely popular program, *Dollars and Sense* is powerful and complete but somewhat difficult to master. Includes checkbook and budget management with attractive graphing functions. Portfolio management and tax forecasting are standard for IBM only (add \$60 for Apple, \$70 for Macintosh). Use with Citibank and Bank of America home banking services with *Moneyline* (optional, \$50).

Monogram Software, Inc. ([213] 533-5120). 128K Apple (not IIGs), Atari, IBM PC, Macintosh. \$100-\$180.

18C Financial Consultant

This package is handy for performing financial planning calculations, such as figuring loan costs, predicting IRA values, and doing break-even analysis.

Advanced Logic Systems ([408] 747-1988). IBM PC. \$90.

MacMoney

MacMoney is a complete personal-finance system that includes sections for budgeting, account management, monitoring assets and liabilities, and printing checks, reports, and graphs. Transfers data to Microsoft *Excel* spreadsheet and *MacIntax* tax-preparation software.

Survivor Software Ltd. ([213] 410-9527). 512K Macintosh. \$75.

MoneyMate

MoneyMate is a well-organized, full-fledged program. It records and reconciles bank-account and credit-card balances, tracks assets and liabilities, prints checks, and generates extensive reports and graphs. Good, plain English instructions throughout, plus solid tax preparation assistance.

RealWorld Corp. ([603] 224-2200). IBM PC. \$169.

On Balance

This package is notable for ease of use. It offers four kinds of reports, including net worth and transactions. Lacks financial calculation capabilities.

Broderbund ([415] 492-3200). 128K Apple. \$60.

Quicken

A well-constructed checkbook organizer and check-printing program with ready access to past transaction records. New version 2 includes additional business-oriented reporting features. Apple version transfers data to *AppleWorks*; IBM transfers data to Lotus 1-2-3 and *Symphony* with *Quicken's* optional *Transfer Utility* disk (\$20).

Intuit ([415] 322-0573). 128K Apple, IBM PC. \$50.

Smart Money

This is a straightforward program with sections on budgeting, check writing, printing, transaction reports, balance sheets, and profit-and-loss statements. It handles several interest-related calculations and produces bar graphs.

Sierra On-Line ([209] 683-4468). 128K Apple, IBM PC. \$80.

Sylvia Porter's Personal Finance Series: Your Personal Financial Planner

A complete program with clear documentation and excellent financial-planning section. Maintains your checkbook, keeps track of your budget, produces wide range of financial statements, including net worth, and tracks assets. The IBM version transfers data to Lotus 1-2-3.

Timeworks ([312] 948-9200). 128K Apple, \$100; C 64/128, \$50; C 128, \$70; IBM PC, \$100.

SPREADSHEET TEMPLATES

Excel Templates

The *Excel* templates, including financial models, range in price from \$2 to \$500. Call the company for a catalog.

Heizer Software ([415] 943-7667). Macintosh. \$2-\$500.

Personal Finances with Lotus

A useful collection of 36 templates for the Lotus 1-2-3 spreadsheet package. Includes personal finance management and financial calculations, investment analysis, and portfolio management.

Automated Reasoning Technologies ([503] 345-7180). IBM PC (Lotus 1-2-3 required). \$60.

Chemical Bank's Pronto home-banking system allows you to check balances from home and automatically pay monthly bills.

late cake and substitute an apple in the dessert category, you will save 300 calories. Multiply that by the slices of chocolate-cake occasions traded each year, and you can figure the effect your changed behavior will have on your waistline.

BANKING BY PHONE

Some time after I began working with *Managing Your Money*, I started using electronic banking, which allows me to pay bills and check my account balances by phone (via modem). After two years of using Chemical Bank's Pronto system, I find it marginally helpful. Were my software and my bank "compatible," I'd be better off. But, as it happens, *Managing Your Money* linked up with Chase Manhattan's electronic banking service after I signed with Chemical.

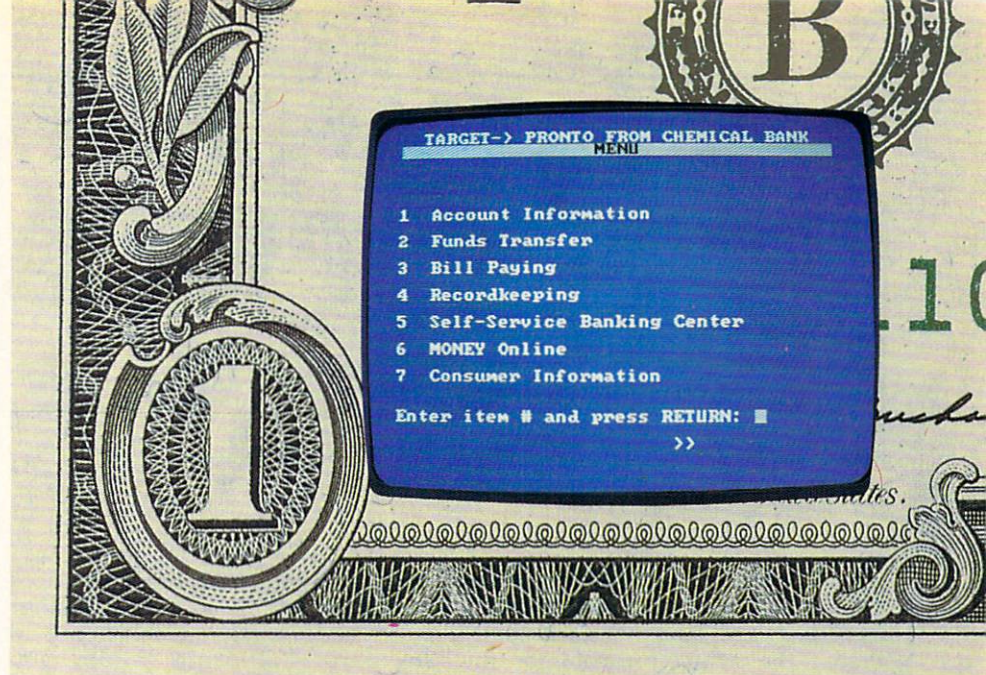
When using the *Managing Your Money*/Chase Manhattan system to make a payment by phone, you enter all the information in your financial program before dialing the bank. Then you log onto the electronic banking service, and the transaction is automatically transferred from your computer to the bank's mainframe.

You can also download a current electronic statement from the bank's computer to your own, allowing your software to update its record of the checks and deposits that have cleared to date and highlight any inconsistencies between your records and the bank's.

As indicated in the accompanying software guide, this level of integration is currently limited to a handful of banks and programs.

As it is, I like being able to check my bank balance whenever my scrawled checkbook entries become too illegible to rely on or to make sure a check has cleared if I receive a second demand for payment. I also make some monthly payments using the service, although I insist on paying my mortgage with a paper check that will return to my hand at the end of the month and offer an enduring record if questions should arise. (You can request verification of a payment made via an electronic banking service, but it's not something you receive automatically.)

The electronic banking system is also handy if you are trying to put some money into savings. Set up an



automatic, regular transfer from your checking account to your savings, and the balance will grow without requiring a separate act of thriftiness for each savings deposit.

For most individuals, telephone banking services (via computers and modems) are strictly conveniences, rather than serious opportunities to add dollars to their bottom lines. Yes, you can theoretically keep money in an interest-bearing savings account, then call the bank and use the electronic banking service to transfer money into your checking account to cover checks you write. However, I can't imagine that the extra interest earned playing money-shifting brinksmanship will amount to more than the monthly service charge for the electronic banking service.

What's all of this worth to you? In my case, I was paying a monthly maintenance for my checking account anyway, and switching to electronic banking added only \$2 to this fee. If I were faced with an additional \$10 to \$12 a month for electronic banking, as some banks charge, it would be difficult to justify.

PLANNING FOR TOMORROW

Many personal finance software packages include features that automatically perform complicated financial calculations. What will your IRA be worth in twenty years? How can you save enough to send Junior to college? If you pay \$20 more than the minimum payment on that installment loan each month, how much sooner will it be paid off, and how much interest will you save over the life of the loan? With the right software you can deduce the answers without asking for outside help, buy-

ing an expensive calculator, or figuring out what formulas to use on your spreadsheet.

Recently, my wife and I found these features very useful when we were considering a home-equity loan. These loans come in more flavors than Baskin Robbins ice cream. The fees and terms vary significantly from one lender to another. We were able to plug these figures into the computer and analyze our options. Equally important, we had accurate financial records to indicate what loan terms we could afford and to present to the lender when applying.

ORGANIZATION MAN

With any financial transaction, you must decide if the investment is justified by the return. In the case of personal-finance software, you have to count the cost of the program and the ongoing investment of your time spent keeping the records up-to-date. However, if you are serious about maintaining and improving your financial health, a computerized budgeting system is a uniquely powerful and effective tool, and the software prices are very reasonable.

It's been my experience that the sense of control I gain is the major benefit of computerizing my finances. I may not have as much money as I would like, but at least I know where I stand from day to day, month to month, and year to year. Ignorance may be bliss, as some people claim, but it can be an expensive form of happiness. All things considered, I would rather have the facts, up to the minute and organized in a form I can understand. It may not make me money, but it probably helps me hold onto what I've got. ■

Getting More from Spreadsheets and Databases Part Two

HOW TO CHOOSE THE BEST PROGRAM FOR YOUR WORK

BY ROB KRUMM

With the wealth of software packages now on the market, people can easily choose the wrong program for the work they have to do. For example, you can buy the most powerful spreadsheet around and still not be using the best program if what you need to do is sort through data in several ways and transform it into multiple reports. Or you could set up an extremely intricate database for research analysis but find yourself up a creek because you need mathematical functions that are available only in a spreadsheet. Such ironies are reasons to be aware of the following guidelines—which were presented last month—for determining whether a spreadsheet or database best suits any particular task.

- Concentrate on content, not form. A spreadsheet, for instance, may seem like the ideal program for bookkeeping because of its row-and-column format, but its content actually makes it better for tasks such as budget projections, where you're speculating about numbers.

- Choose a spreadsheet when you're working mainly with dependent values, a database when the values are mostly independent. For example, tracking what you've spent over the course of a year is a database application, since the amount spent is independent of other values; but figuring out your income taxes is a spreadsheet application, since various numbers are dependent on other numbers.

- Selection and sequencing charac-

ROB KRUMM is founder and owner of microComputer Schools, Inc. in Walnut Creek, California. He has written several computer books on major software packages; the latest releases are *Understanding and Using dBase III Plus* (Simon & Schuster/Brady Company) and *Using Lotus 1-2-3 for Business* (Addison-Wesley).

terize database managers. If you need to select subgroups of data from your main body (such as all clients in southern California whom you haven't called in six months), or if you need to sort through data in multiple ways, you probably need a database. If you only occasionally need to sort through your data, however, a spreadsheet's data-handling functions can be enough.

- For transforming data into a variety of reports, a database is the better tool. For example, a mail-order business needs to extract a range of information from its customer base, such as mailing labels, form letters, and invoices.

Now let's see how these considerations were handled by some of my students in real-life situations.

SPREADSHEET MODELS AND DATABASE TRANSFORMATION

Glenda Bowman, a nursing administrator at John Muir Medical Center in Walnut Creek, California, set up a model with a spreadsheet to solve a staffing problem. She needed to calculate the number of nurses needed for each shift, which is dependent on the number and condition of the patients on the floor. Figure 1 shows a spreadsheet model that demonstrates

	A	B	C	D	E
1	Nursing Schedule			Staff Needed	
2					4,375
3	Patient	Hours			
4	Good	2.5			
5	Fair	3			
6	Stable	4			
7	Unstable	5.5			
8	Poor	7			
9	Critical	9			
10					
11					
12	Bed	Condition	Hours		
13	1	Stable	4		
14	2	Fair	3		
15	3	Critical	9		
16	4	Good	2.5		
17	5	Stable	4		
18	6	Fair	3		
19	7	Poor	7		
20	8	Good	2.5		

Figure 1: Spreadsheets help you create models of real-life situations. Nursing administrator Glenda Bowman figures out staffing schedules using Lotus 1-2-3.

the connection between two tables. The top table is a list of patient-condition ratings, while the bottom table shows the conditions of actual patients in the eight beds on the wing. Bowman used spreadsheet formulas to relate the data in the two tables to find the total number of patient-care hours required. Dividing that by an eight-hour shift produced the number of nurses needed for that shift.

By using a spreadsheet model, Bowman can update the patients' conditions and immediately discover how that affects the staffing requirements. This is the primary advantage of spreadsheets. Note that Bowman needs a spreadsheet program that is capable of dealing with both text and numeric items, since the values for patient conditions are expressed as words, not numbers.

Transformation was the problem faced by pharmacist Terry Kamrin, of Pleasant Hill, California. He found that he was recording the same information daily in several different places. When Kamrin filled a prescription, he recorded the information on the label of the pill bottle, in his records, and then on insurance forms. The matter was complicated by the fact that the information about the drugs and the customer was often exactly the same each time a prescription was filled.

Kamrin had two goals: first, to store the historical data about drugs and customers, and second, to transform the information so that it could be used on labels, reports, insurance forms, and statements, without ever having to enter it again.

Both requirements pointed to a database program. Specifically, Kamrin needed to find one that allowed a high degree of flexibility when it came to the transformation of data onto various forms, since he was dealing with labels, insurance forms, and regular letter-sized paper.

Kamrin first used dBASE to create a system that allowed the single entry of a name or a drug to appear wherever it was needed on any of the forms on which he was working. He stored historical data on disk and used the transformation capability of databases to make his work more efficient. Now he has moved the bulk of his work to a dedicated database for pharmacists (Pacific Pharmacy Computer [209] 224-0401).

Tom Goren, my accountant, was faced with the problem of finding a way to generate tax tables and schedules more efficiently and occasionally integrating these into a word processor. Goren realized that these tables

The figure shows three overlapping screenshots of a database program. The top screenshot shows a form for entering client information (Name, Address, Phone) and a list of services with associated rates. The middle screenshot shows a form for entering time spent on a specific client, with fields for date, time, and a description. The bottom screenshot shows a final bill for a client, detailing the services rendered, the time spent, and the total amount due. Arrows indicate the flow of data from the input forms into the final bill.

Figure 2: Database programs let you place the same information into various forms. Here client and time billing is transformed into a final bill.

and schedules are not lists of numbers but the result of a series of related calculations. While a few of the assumptions changed for each client, the basic structure of the calculation always remained the same.

Because his application used a small number of independent values and a larger number of dependent values, Goren realized that he needed a spreadsheet. He chose *Framework* (Ashton-Tate, [213] 329-8000), an integrated program that also contains word-processing facilities. Goren was able to use both the spreadsheet and word processor to create the documents, tables, and schedules he needed.

Goren's other major requirement was tracking his hours and generating up-to-date bills for clients. In this case, Goren looked for a dedicated database application that allowed him to enter raw historical data in several forms and produce from that data a totally different format to serve as billing for his clients. He used a program called *Timeslips* (North Edge Software, [617] 468-7358). In figure 2 you can see how *Timeslips* operates as a dedicated database. The first screen shows Goren's entry of an item for which the client is to be billed. The second screen shows an entry made for the client, with the client's name, address, and other individual information. The third

screen shows how *Timeslips* was able to transform the raw data from both screens into a totally different format: a bill for that individual.

Now let's look at further criteria in choosing the best application for your work.

GENERAL PURPOSE OR DEDICATED?

Software often comes in two distinct forms. The spreadsheet and database applications discussed last month are general-purpose programs—that is, those not dedicated to specific tasks, such as personal finance, mailing lists, or accounting. A dedicated program is based on the general characteristics of either a spreadsheet or database, but its design has been altered to fit a specific job. In the spreadsheet area, tax-planning or investment-analysis programs are examples of dedicated applications. Dedicated databases handle specific types of data, such as billing, invoicing, scheduling, reservations, or property management.

The advantage of dedicated programs is that part of the work needed to set up the task—or all of it—is already done for you. This makes getting started with your work much simpler. On the other hand, dedicated applications, by their very nature, restrict you to the setup created by the designer.

It's harder to get started with a general-purpose program because you have to learn how to set up every task from scratch. But once you have set it up, you can change it as your needs change; there are no restrictions. Also, you have the added satisfaction of knowing that the way you have structured the program reflects your own ideas and requirements of how the task should be carried out.

Dedicated applications work well for those individuals whose needs closely follow the program's preset structure. To avoid buying an application that is too rigid and inflexible for your needs, first familiarize yourself with those structures before buying a dedicated program. For example, if you run a business—such as a clinic or hair salon—where people arrive by appointment, a dedicated scheduling program might be just the thing. However, despite certain similarities, a doctor and a hairdresser have different requirements that may or may not be satisfied by the same dedicated package. By and large, general-purpose programs offer more power and flexibility than dedicated ones and are usually better values.

PICKING PROGRAMS BY FEATURES

Some general concepts can help you pick out potentially significant features when trying to decide about database and spreadsheet programs.

1. Computer applications can handle three basic types of information: numeric values, text, and logical values. Numeric values are the most basic elements to computers and the easiest type of data for computers to handle. The term *numeric* is used to indicate that only data with numeric value falls into this category.

Numbers with no value, such as phone numbers or Social Security numbers, are not considered numeric values. They are part of the second category called text or *character strings*. The term *string* implies that, to the computer, text information is simply a sequence of characters. The fact that they are grouped together to form a word that you or I can recognize is insignificant to the computer's operation.

The third type of data is the answer, true or false, to some logical statement, such as "Five is greater than 14." Tests can be made for equality, inequality, greater than, less than, or some combination. Databases use logical values to select subgroups from the main group.

2. For each of the three data types, computers allow two distinct forms: *literal* and *symbolic*. The literal form is one in which the value appears directly. The symbolic form is one in which the data is expressed as a symbol that stands for a potential value. For example, a literal calculation would be $19 + 141$, but a symbolic calculation would be $PRINCIPAL + INTEREST$, in which the words symbolize values. (See Figure 3.)

The general design of a spreadsheet program places most of its power in handling literal numbers, literal text, and symbolic representations of numbers. Spreadsheets are much weaker when it comes to sym-

	Literal	Symbolic
Numeric	Example: $100 + 200$ Usage: Direct calculation similar to using a pocket calculator.	Example: $+a1+b1$ Usage: To build formulas in spreadsheets and databases that carry out calculations.
Text	Example: "Hello Joe" Usage: Direct entry of text such as word processing or data entry.	Example: Dear [name], Usage: Allows you to substitute words into text such as form letters.
Logical	Example: $100 + 200 = 300$ Usage: Tests the truth of a logical statement. Rarely used.	Example: Customer = "Smith" Usage: Compares items, numeric or text. Used to search databases for individual items.

Figure 3: Computers handle three basic types of data—numeric, text, and logical values—in two distinct forms, either literal or symbolic.

bolic representation of text. That is why tasks such as project planning, forecasting, and budgeting do well on spreadsheets because they deal mainly with numeric values. Tasks such as mailing lists that contain mostly text are more oriented towards databases, whose main strength is usually in handling literal and symbolic text items, as well as logical values.

3. Spreadsheets, because of their strength in the numeric area, often are capable of performing complex mathematical calculations such as standard deviations, annuity calculations, and trigonometric functions.

Database programs can usually add, subtract, multiply, and divide but usually lack advanced mathematical functions. For example, *dBASE III Plus* will perform exponential calculations but has no built-in facility for handling trigonometric operations such as sine and cosine (although such functions can be added).

Spreadsheets usually have very limited facilities for making logical comparisons, especially when it comes to text items. This is important when your task involves the selection of specific items from a larger group.

4. That's why, when you look at a

product's features, it's important to pick the ones that are really different or unusual for that type of program. A spreadsheet program that can calculate averages is not unusual. A spreadsheet program that is able to perform operations on text as well as numbers is one that has added a significant feature. For example, this is one major difference between Version 1A of 1-2-3 and Release 2.

On the other side, a database program that can select subgroups is nothing special. A database that can perform mathematical operations such as exponentiation or square roots is more unusual. If you wanted to perform statistical analysis using a database, for instance, these functions would be very helpful.

If you plan to stretch the limits of the software, look for features that really do expand the functionality of the program into new areas. Also keep in mind that just because a feature is included does not mean that it works as well as the same feature in a different type of program; the amount of power behind the feature is a factor that has to be considered. (See "Software That's Special.")

SEEING BENEATH THE SURFACE

Analytical questions are really devices to help you clarify issues. They do not always yield unambiguous answers, but they do help you get a handle on difficult questions. When it comes to relating real-life tasks to computer applications, the ideas discussed here should help you begin your analysis.

First, determine whether your data is historical, with independent values, or a set of related dependent values. Next, ask if the data requires sequencing or selection of specialized subgroups. Then, think about the ways that information must be produced or printed out. Will it take a single form, or is the goal to produce a number of variations using the same data? Also, ask whether or not your task fits into some standard procedure that will conform to the structure of a dedicated program, or whether you need to apply your ideas with a general-purpose program.

The key to better use of your computer is to see beneath a program's surface and understand the fundamental strengths and weaknesses each type of application brings to a particular task. Just as in repairing your car, the benefits of using the right tool for the job will, in the long run, outweigh the time spent in learning how to use that tool. ■

SOFTWARE THAT'S SPECIAL

Spreadsheets and Databases That Share Each Other's Features

In this article and last month's Part One, we've discussed how to choose between a spreadsheet and database by examining the nature of your work. So which one are you choosing?

Well, you may be able to choose one and still get quite a bit of the other. Say you're a personal-finance consultant. You need to keep records on all your clients and their investments (database tasks), while figuring out various money questions (which requires the financial functions found in spreadsheets). You could use both types of programs, but that creates extra work when you need to share information across applications (and it costs more, too). Or you could use an integrated package that includes both a spreadsheet and database. That's often a good solution, but sometimes the individual modes in an integrated package are not as powerful as stand-alone programs.

There's a third solution. An increasing number of spreadsheets have included (or let you include, with programs called *add-ins*) functions normally considered part of the database arena; the prime example is reporting. Similarly, but to a lesser extent, there are databases that include spreadsheet-like capabilities such as financial functions. We've brought together a list of some of these advanced applications, along with comments about some of their special features. (Titles listed for the IBM PC will run on most compatibles. Check with the publisher or your dealer for exact information.)

4VIEWS. Even though you can sort and search through records when you use the Lotus 1-2-3 spreadsheet as a database, there are still some data-manipulation features missing. But the designers of 1-2-3 were foresighted; they allowed developers to write programs that work inside 1-2-3, adding new functions. Appropriately enough, these programs are called *add-ins*. The 4VIEWS add-in allows you to transform your data with new reporting and data-entry capabilities. For instance, in a normal 1-2-3 database, each record is in a row, which is inappropriate for mailing labels. With 4VIEWS, however, you can move around and analyze the data in several forms, including mailing labels.

(Turner Hall Publishing, [408] 253-9600. IBM PC [requires 100K beyond memory used by 1-2-3]. \$100.)

Javelin. The old distinction between spreadsheets and databases flows over lines with my favorite financial-analysis package. Even though *Javelin* offers a spreadsheet-type face of rows and columns, data is assigned logically by date (day, month, year) and purpose (rent, expenses, and interest, for instance) rather than physically by row and column. This allows you to extract data logically; such as, all travel expenses for January, February, and March. (Javelin Software Corporation, [617] 494-1400. 512K IBM PC. \$100.)

Reflex and Reflex Plus. Both versions of the *Reflex* database program (*Plus* is for the Macintosh and also adds relational database capabilities) include lots more numerical analysis functions than the average database. The several categories of functions include statistical, trigonometric, and financial. Specific functions range from net present value to standard deviation. (Borland International, Inc., [408] 438-8400. 384K IBM PC, 512K Macintosh. \$150 [IBM], \$279 [Macintosh].)

Silverado. This new database add-in from the publishers of the *SuperCalc4* spreadsheet works with Lotus 1-2-3 as well. Capabilities include multiple views in the report function, such as scrolling through the database on a record-by-record basis or transforming data into mailing labels. You can also import *dBase III* files for further data manipulation. (Computer Associates International, Inc., [408] 432-1727. IBM PC [Requires 119K beyond memory used by 1-2-3]. \$149.)

VP-Planner Plus. A spreadsheet that's compatible with Lotus 1-2-3 (as is the original *VP-Planner*), *VP-Planner Plus* offers several extra features. Most pertinent to our discussion is its ability to read, write, and create database records in *dBase* format. This allows you to transform your data into a variety of formats, a feature usually found only in database programs. (Paperback Software, [415] 644-2116. 384K IBM PC [Requires 448K for multidimensional database files]. \$180.)

Why Borland President Philippe Kahn Stays Home



Philippe Kahn, president of Borland International, Inc., likes to hold meetings with employees and colleagues in his mountain home.

The parking spot reserved for "Philippe" in Borland International's lot is often empty during the middle of a workday. Instead, you may find a Porsche 928S parked about four miles away in the driveway of a graceful mountaintop residence. And somewhere on this

FOR THE LEADER OF
ONE THRIVING
SOFTWARE COMPANY,
THERE'S NO PLACE
LIKE A HOME OFFICE

BY BERNADETTE GREY

BERNADETTE GREY is a senior editor for FAMILY & HOME-OFFICE COMPUTING.

property, you may also find Philippe Kahn, founder, president, and chief executive officer of Borland International, Inc.

When he's not on a business trip to the East Coast or Europe, Kahn sometimes works out of his newly built house, nestled on a 40-acre spread overlooking Scotts Valley, California, which is also home to his company. (On a clear day, you can actually see Borland buildings from his house.) Kahn's elegant tree house in the redwoods offers visitors a panoramic view of the Golden State's ever-changing coastal mountain range, the Pacific Ocean, and Monterey Bay. And it offers Kahn a tranquil and relaxing retreat where he can conduct meetings, write letters, design programs, and focus on Borland's new directions and expanding product line.

In 1982, Kahn moved to the United States from France—with a Pascal compiler he had designed in hand. When none of the U.S. software publishers he approached would distribute it or publish it, Kahn decided to sell it himself via mail order. With a few thousand dollars and the pragmatic goal of "paying the rent," Kahn incorporated Borland and introduced *Turbo Pascal*. Today, Borland is one of the largest companies in the software industry: In a little more than four years, its employee roster has swelled from two to 350 people (see "About Borland," right).

STAY HOME: IT'S GOOD FOR BUSINESS

Working from home is important to the success of Borland, says the 35-year-old president, particularly because the company has burgeoned so quickly and unexpectedly. And he contends that other company executives would benefit from spending more time at home. "When a company starts to grow, you're faced with two things," says Kahn. "Either you stay involved in the day-to-day operations, leaving you with no time to look at the big picture, or you say, 'Wait a minute, I'll spend some time at the office and the rest of the time I'll spend talking to people or thinking about how to build products and how to strategize for the future.'"

"I'm a lot better off doing it [looking at the big picture] in a place like this or on my sailboat. . . . I'm uninterrupted, I'm in a quality environment, and I work when I want and how I want."

It's easy to understand why Kahn would rather stay at home than go down the mountain to Borland.

**"SOMETHING VERY
DRAMATIC IS HAPPENING
RIGHT NOW SUDDENLY
YOU HAVE THE CORPORATE
STANDARD—IBM-
COMPATIBLE MACHINES—
GOING DOWN IN PRICE
AND RUNNING THE
SAME SOFTWARE THAT IS
RUN IN THE OFFICE."**

When he works from home, he's able to structure his day the way that best suits his lifestyle. If he chooses to take a break in the middle of the afternoon—to go for a walk or run, pick up a flute or saxophone, or take a dip in the pool—he can. For Kahn, these interludes are good for business. "There are lots of trails around here in the redwoods where I can be all alone to think," said a relaxed, casually dressed Kahn, as he sat in his glassed-in living room one recent Friday morning. "It's much more inspiring than sitting in an air-conditioned, sanitized, executive-type office."

Kahn's actual workspace at home is set up much like a conventional office. There he keeps an IBM Model 60, a Macintosh SE, and an Image-

ABOUT BORLAND

Borland International markets a diverse line of low-cost business, productivity, and programming language software for IBM PCs and compatibles and Macintoshes. Founded in 1983 by Philippe Kahn, Borland posted revenues of \$29.2 million for the year ending March 31, 1987. Today, the company has more than 350 employees and is a public company on the Unlisted Securities Market in London. And during 1987, Borland acquired Ansa Software, another stable and growing software publisher.

Kahn started the company with a single product, *Turbo Pascal*, a programming language compiler, and today Borland sells 25 programs. While its best-known product is probably *SideKick*, a memory-resident personal organizer, Borland sells software for a wide spectrum of applications: The company's other RAM-resident programs are *SuperKey*, a keyboard-enhancement program; *Turbo Lightning*, an electronic spelling checker and thesaurus; *Eureka: The Solver*, an equation solver that provides solutions to math problems; and *SideKick Plus*. Borland's successful line of programming language software includes *Turbo Pascal*, *Turbo C*, *Turbo Basic*, and *Turbo Prolog*. *Sprint: The Professional Word Processor*, *Quattro: The Professional Spreadsheet*, and *Paradox and Reflex*—database-management programs—all belong to Borland's Professional Business Series.

Writer II. He also has a Konica facsimile machine and a Sharp copier. Bookshelf-lined walls store software packages, manuals, chemistry and physics textbooks, and books by such writers as Edgar Allan Poe and Jack London. However, unlike the shelves in most ordinary offices, those in Kahn's home office also hold stereo system components, a wide assortment of albums, tapes, compact discs, musical instruments, and sheet music, reflecting his fondness for music.

And the boundaries of Kahn's workspace extend beyond these walls. If you walk around to the other side of his fireplace, you find yourself in his living room, which is furnished with two couches, a Steinway grand piano, and a telescope. It's here or at poolside that Kahn is likely to hold meetings. He also sits at the pool area when he's working with a portable computer. Since he has a phone line outside, he can plug in his computer and modem and enjoy the California weather.

HOME SWEET OFFICE

In many ways, Kahn's home is an extension of Borland headquarters. Employees send notes and information to Kahn throughout the day and night via electronic mailboxes and facsimile machines. He usually keeps in closest contact with his research and development staff and with company vice presidents. And if an employee has to meet with Kahn, he or she may have to drive up the mountain to see him. Employees and outsiders frequently convene with Kahn at poolside and sit around an umbrellaed patio table. When entire departments hold brainstorming sessions, Kahn has been known to set up tables and chairs and hold dinner meetings right by the pool, weather permitting.

Of course, to do this, a company executive has to be willing to expose his or her private life to employees. Even though Kahn might not call himself a workaholic, Borland is, indeed, a very significant part of his life—whether it's 9 a.m. on Monday or noon on Saturday. "I know that I mix my life a lot with the company," says Kahn, "but that's because I enjoy what I do."

His enthusiasm for working at home has obviously rubbed off on his staff. Many Borland employees have computers at home so that they, too, can bring work home from the office. Some people, such as software developers, follow Kahn's example and opt to work from their own homes in-



Philippe Kahn has equipped his home office so that it serves as an extension of Borland headquarters. In addition to an IBM Personal System/2 Model 60 and a Macintosh SE, he relies on a Sharp personal copier, a Konica facsimile machine, and a multiline telephone to make his office functional.

stead of going into the office. "Depending on what you do, working at home is very important," says Kahn. "You know, the whole idea is getting things done, and sometimes you can better get those things done when there aren't other people around you and you're outside of an office environment."

SPECTACULAR VIEWS OF THE HOME OFFICE

Kahn envisions that some day soon, home-based offices will be the norm rather than the exception. Already, one out of every five people works either full-time or part-time out of his or her home; Kahn sees that percentage increasing, with computers and electronic mail paving the way. "Something very dramatic is

happening right now, and it's very different than what we're accustomed to," says Kahn. "You have the corporate standard—IBM-compatible machines—that is going down in price and running the same software that is run professionally in the office.

"I think that there's going to be a big revolution in the next two to three years and you'll be able to go to K-Mart or to Crazy Eddie and buy a machine that for \$200 or \$300 will essentially do what a machine that costs \$3,000 does today."

As Kahn sees it, if these machines become as commonplace as, say, stereo systems, they will change the way people feel about their jobs. While acknowledging that offices in households "make the home less personal," he thinks working at home will im-

prove job satisfaction. "As more and more people start working out of their homes, they will become much more directly involved with what they do," he says. "There's a typical mentality that 'I get off work at five. My workday is over, and I don't want to hear any more about it.' . . . I think that the same machines in the homes that are in the office gives people a chance—outside of the office and outside of the structured working environment—to get more control over what they do."

Of course, depending on his travel schedule, Kahn does spend time at Borland headquarters. "Then I do what people do in an office, meet people and be aware of what's going on."

And maybe he wants to make sure he doesn't lose his parking spot. ■

Corporate Homeworkers

TECHNOLOGY TURNS HOME OFFICES INTO CORPORATE OUTPOSTS

BY BARBARA STEIN

There are days when it doesn't pay to show up at the office. And lately, millions of employees are doing just that, not showing up. Not physically, at least. While the rest of us hang onto subway straps or battle rush-hour traffic, this privileged group is already at work—at home, in fully-equipped offices, where the commute averages less than 30 seconds. These folks are telecommuters, corporate employees who commute via computer.

WHO'S TELECOMMUTING AND WHY?

Thanks to computers, facsimile machines, modems, and low-cost telephone hookups, any employee who generates, disseminates, or analyzes information is a potential candidate for telecommuting. Jobs such as data processing, project management, programming, accounting, and public relations—just to name a few—are particularly well suited to the work style. In fact, according to a special report issued by Link Resources (Electronic Services Unlimited Telework Group), "some 15 to 20 million jobs are structurally capable

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of being done at least part-time at home."

Why have so many employees traded the corporate setting for an office at home? In a broad sense, the reason is sandwiched somewhere between the American Dream—freedom to call the shots in a self-designed time frame—and the comfortable security of collecting a company paycheck. In her 1984 study of home teleworkers for Xerox Corporation, consultant and home-business authority Joanne H. Pratt concluded, "Underlying most workers' comments was a desire to gain more control over their own lives. Workers expressed the 'ideal' way to work as having one to three days in the office and the balance at home . . ."

While the notion that employees can be just as productive working at home as in the office may sound radical in some circles, in reality the practice is far from new. The electronic revolution has simply opened new vistas. "People have been carrying that briefcase home for years," says Management Consultant Gil Gordon, editor of *Telecommuting Review* (Gil Gordon Associates, 10 Donner Court, Monmouth Junction, NJ 08852), a monthly newsletter for corporations, and co-author of *Telecommuting: How To Make It Work for You and Your Company* (Prentice-Hall, 1986). "They work at home after hours on PCs purchased with their own funds, bang away on projects, and eventually say, 'Why should I get dressed, sit on a freeway, and get frazzled to commute to a computer?' So they approach management, seeking to extend homework to daytime hours and ease into it one or two days a week."

"It's a way for people to have their cake and eat it too," adds Senior Planner Patricia Mokhtarian, Ph.D., coordinator for the Southern California Association of Governments' (SCAG) telecommuting program—a

pilot initiated to improve the state's transportation and air quality: "We've also found it's a great way to keep the family unit together." Bill Boyd, SCAG's assistant controller, who has worked at home part-time for more than 18 months, heartily agrees. "I started telecommuting to facilitate the care of my wife, who has MS [multiple sclerosis]. I'm more flexible now and can adjust my work schedule to her needs. My being home makes it easier for both of us."

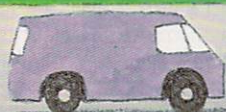
ADVANTAGES

Aside from improvements in their personal lives, homeworkers report numerous other benefits: increased productivity, flexibility in combining work with home life, and significant savings in work-related expenses.

Increased Productivity. Anyone who pictures telecommuters lolling in backyard hammocks is in for a surprise. "In terms of productivity," says Gordon, "studies show a 15- to 30-percent increase because employees at home tend to work more hours and get more accomplished." Gordon is not implying, however, that these employees put in 24-hour days; rather, that they accomplish more by taking advantage of the nonproductive time periods common in the corporate setting. Consider the hours wasted traveling to work, for example. Pratt's teleworkers reported saving one to two hours each day by not commuting. Another 30 to 45 minutes is freed up by eliminating the morning "dress for success" routine; for many, jeans, sweats, and sneakers are standard. Add those hours to the time gained simply because coworkers aren't popping around partitions to discuss unrelated matters.

Escaping in-office distractions is one reason why Pacific Bell Project Manager Steve Renten—one of more than 500 PacBell managers who telecommute regularly—went home to work three years ago. "I knew there would be a reluctance on the part of people to call about unrelated matters; I was banking on this," he says from his home office in Oakland, California. "Even before our project started, I was taking occasional days off to work at home. Now my office is an extension of the company. We exchange E-mail daily, and I have two voice lines supplied by the company and a data line. If something comes in on the mainframe, I can use the phone."

In Fort Collins, Colorado, a city of 85,000 located 60 miles north of Denver, "productivity is the name of the



game," according to Administrative Services Director Peter Dallow. Fort Collins was among the first municipalities to offer telecommuting to all city employees. "Our total vision was to put computers on every desk and supply all the equipment," says Dallow. "When that happened, we realized that what we do at the office could be just as easily done at home. Today, our managers are encouraged to use electronic flextime. All our council members telecommute part-time, and we even put some of our vendors on computer and trained them to call us on theirs. We're more productive now. Morale is high, and employees get quiet time and flexibility to schedule their work."

Flexibility in Combining Work with Home Life. Home becomes the major base of operation for telecommuters who are raising children. And the result is a new family closeness. Parents are accessible to children, the latchkey hangs forgotten on its hook, and teens get a dose of the real world by watching their parents at work. PacBell Media Relations Manager Sandy Hale of Mill Valley, California, opted to work at home six weeks after the birth of her second child. She says, "I was serious about getting back to work as soon as possible after the birth, and I had no illusions about working full-time and caring for a baby. While it's not a substitute for child care, it leaves me more flexible." To maintain that flexibility, Hale arranged for her next-door neighbor to take care of the baby during the day, and she is happy with the results.

Flexing time for family life is not the only way to combine home and career. Taking advantage of an unusual telecommuting program established by her company, Systems Analyst Hedi Hesse of Alameda, California, chose to work at home in order to complete her college degree in psychology. "I've had that dream forever," she says. "I was looking for night jobs to free up my days when I read about the program in the company newspaper, and I jumped on it." Today Hesse works full-time maintaining databases and supporting a PacBell-user community of 100 while taking a full course load at nearby University of California at Berkeley. "I leave one day a week free for in-office meetings and take classes in the early morning or early afternoon. I can always make up whatever I miss when I'm off shift by working weekends or until 2:00 a.m. The amazing part," she adds, "is that I'm more valued

now that I work at home. When users have emergencies and call me at home, I run a report and send it to them via high-speed printer. They're very impressed! It's funny because I'm not doing anything differently now than before."

Economic Savings. Trimming the family budget is a benefit that many homeworkers realize instantly. Consider the savings on corporate wardrobe purchases, for example. More specifically, employees in Pratt's study estimated saving \$100 per month on clothes, \$200 per month on food, and more than \$100 per month on gas, parking fees, and automobile insurance.

Child-care expenses can also be reduced if parents work in shifts. "We've saved a lot on day-care spending," says Systems Analyst Gus A. Miklos, who researched and wrote the proposal for Fort Collins before going home to work in nearby Loveland six months ago. "Because my wife works outside our home part-time, we've arranged our schedule so there are times when I can watch our baby and 2½-year-old girl."

ADJUSTMENTS, PITFALLS, AND FEARS

Just as it takes time to adjust to a new work site, employees who relocate to home must work through a transition period during which a new set of choices and responsibilities looms. Not surprisingly, experts have found that success at home hinges on the person's ability to survive the transition and his or her willingness to develop new skills.

Personality and Motivation. "The key variable in whether or not someone is successful working from home is personality, not the company or the job," report consultants Paul and Sarah Edwards, authors of *Working From Home* (Jeremy P. Tarcher, Inc.; 1985, revised 1987). "It's the individual and his or her disposition. Most people are not well prepared to manage themselves because that hasn't been emphasized in their work. There is a learning curve. But motivation and self-management skills can be developed."

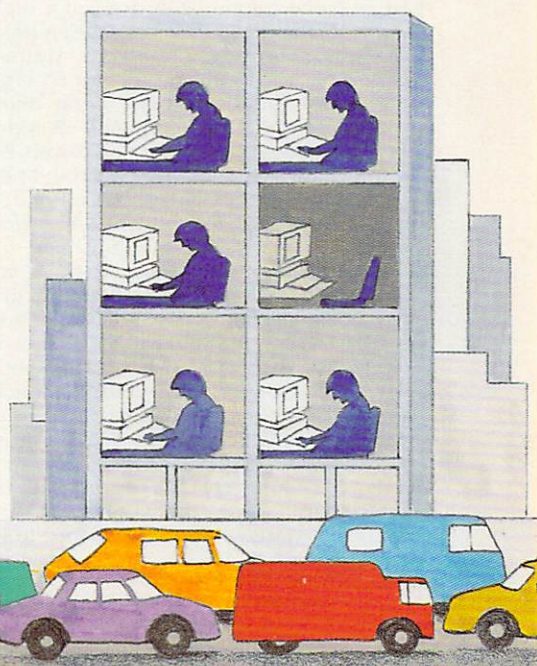
PacBell conducts training seminars to prepare its employees. According to company spokesperson Dori Sera, the half-day training course introduces workers to the advantages and the disadvantages of working at home and offers strategies for counteracting problems. "We also prepare the employees' bosses," says Sera. "It's important to change the out-of-

sight, out-of-mind mentality by preparing them to monitor results, not progress."

The Perception of Peers. Out-of-sight, out-of-mind thinking on the part of in-office co-workers also can present problems for telecommuters. Two issues are worth considering: First, many homeworkers, in their zest to maintain management's trust and produce results, inadvertently isolate themselves from the rest of the company. As a result, some in-office colleagues simply forget that home-based workers are available resources. Often, however, this can be a major drawback. Although a receptionist may have instructions to connect a homeworke's caller to him or her, some telecommuters report they get very few calls at home. If you're not in the office, people get the impression you're not accessible.

This leads us to the second issue. Initially, many homeworkers report that their office co-workers are reluctant to "bother" or "interrupt" them during the workday. "There seems to be a perception (by some co-workers) that maybe you're not working now that you're out of management's eye," observes Michael Gitter, Fort Collins' cable program director, who writes scripts at home part-time and spends the balance of his week in the city's production studio. "When I first started, people kidded me, 'So you've been partying for the past few days.' People were reluctant to call me at home. But I worked through other people's initial resistance, and it's fine now," says Gitter.

Research shows that these and other problems can be overcome if employees maintain regular contact by phone and E-mail and make an effort to be visible during trips to the



office. "The key is in the planning process," says Gordon. "You've got to figure out how much time you'll spend in and out of the office and how to stay in touch. Make the best use of phone contact, and separate contact which is social—the pressing-flesh syndrome—from the business-oriented meetings. Take a look at what the job requires and what you require personally, and combine the two."

The Edwardses, consultants to several corporations that are setting up telecommuting programs, advise homeworkers to take the initiative in remaining part of the group. "Homeworkers are not there for drinks after work or during lunch," they point out. "So it's important that they build on the time they're in the office—invite people for dinner, read the company bulletin board, and participate in social activities."

When Ellen Woodill, coordinator for the First National Bank of Chicago's telecommuting project—now a career development option for full-time salaried employees—became aware of the pitfalls, she incorporated them into her proposal to sell to management. "Our program is based on the premise that in data processing, all our professionals work at home some of the time," she says. "One reason

that our program works so well is that our homeworkers come to the office one or two days a week. It's a good time to touch base with peers. The other reason it works is that we treat people as professionals. We know they'll do what makes sense. It's up to the manager and staff to work it out." Senior Systems Consultant MaryAnn Bandur, who switched from part-time to full-time when the project got under way, appreciates the bank's philosophy. "Peni Campagna [a vice president with the bank] and Ellen Woodill, as sponsors of the work-at-home program, cleared the way for me," she says, "and I've had lots of backing and support. That really counts. It allows me to continue with my career and spend time with my children when they need me. It's worked out beautifully."

Concerns over Promotions and Raises.

A final area of concern relates to fears of being overlooked for promotion. While some homeworkers report regular pay raises and advancement, others believe they've traded a career step for the privilege of working at home. Still others feel they've been skipped over completely.

These homeworkers might feel that they're out of the mainstream and also might have conflicts in appropriating their time. They're under stress

about it and worry about losing their place in the office hierarchy: "But," Pratt points out, "there is no absolute measure. People on-site also are passed over."

For some telecommuters, concerns about missing out on promotions and raises and lack of contact with other employees limit their participation in work-at-home programs to one or two days per week. "I did feel a little bit out of touch," admits Bandur, who changed a Thursday and Friday telecommuting schedule to Tuesday and Friday to avoid a four-day absence from the bank. "I was due for a promotion on my part-time schedule," said Bandur, "but rather than a promotion or a raise, I received full-time status and participated in the work-at-home program for two of those days, which I felt was more valuable."

THE FUTURE OF TELECOMMUTING

In his best-seller *The Third Wave*, scholar and social critic Alvin Toffler devotes a chapter to the electronic cottage and what he calls "our advance to a new production system." He writes, "The new production system could shift literally millions of jobs out of factories and offices—where the Second Wave swept them—and right back where they came from originally: the home. If this were to happen, every institution we know, from the family to the school and the corporation, would be transformed. To suggest that millions of us may soon spend our time at home, instead of going out to an office or factory, is to unleash an immediate shower of objections."

USC Senior Scientist Jack Nilles—dubbed "The Father of Telecommuting" for coining the term—is dealing with those objections and others everyday. Although his studies show that telecommuting offers direct benefits to the corporation as well as to its employees, formalized programs have been slow to catch on. Why? "Telecommuting involves a culture change, and cultures don't change overnight," says the author from his home office in Los Angeles. "But," he adds, "we have seen it work in small, innovative companies, especially computer-related industries or where a single employee champions the concept in an existing company and is willing to put up with the flack until he or she can prove that it works."

"By the year 2010, everyone who wants to will have taken advantage of telecommuting at home or in satellite offices." ■

HOW TO TALK UP TELECOMMUTING TO MANAGEMENT

Formal corporate work-at-home programs such as PacBell's are rare, according to a Link Resources survey. Most telecommuting arrangements evolve as the result of informal negotiations between the employee and the corporation. Here are pointers on convincing your company if you decide working at home is for you.

Decide if You're Suited to the Work Style. Suggests *Telecommuting Review* Editor Gil Gordon: "Take a long look in the mirror and ask yourself why you're interested. Is it the commute, or are you a night owl who does his or her best work outside the office? Can you motivate yourself without a boss? Are you a planner, organized and self-disciplined? What about your need for social contact?" *Working From Home* authors Paul and Sarah Edwards have developed a paper-and-pencil test to help potential telecommuters determine their suitability to the work style.

Establish Trust with Management. "If you go in cold and tell a potential employer that you'd like to work for him or her and, furthermore, that you'd like to work at home, the deck is stacked against you," says small-business consultant Joanne H. Pratt. "But if somebody knows you and your work, it'll be easier to sell the idea." Adds Pacbell Project Manager Steve Renten: "I've found that it depends on the relationship with my supervisor and whatever relationships I established in order to do my job."

The Approach. "Recognize the likelihood of resistance, and approach it gradually," says Gordon. "Look at it from the point of view of the company. Why should the company allow you to telecommute? Answer this question before approaching your supervisor." Pratt advises, "If you've already got the job and see that it can be done equally as well or better from a home office, jot down what you have in mind. Take it to your supervisor, and sit down and talk it over."

Start out Slowly. "Suggest to your manager that you'd like to start out on a trial basis," says Pratt. "One reason telecommuting programs are successful is that management can always call the worker back to the office. It has a self-correcting mechanism."

Gordon counsels people to begin by taking one day per week at home for the first few months. "It's very simple where there is little risk involved and it's easy for management to see how it's working and how it progresses. Then you can move it up. It's a good way to reduce resistance."

Help Establish Measurable Results. "Agree on specific deadlines, and send in periodic drafts so your supervisor knows what's in progress," suggest the Edwardses. "In the beginning, everything you can do to establish that kind of relationship eases and safeguards your working at home. The extra effort is well worth it in the long run." Adds Pratt, "Then demonstrate that you work just as well or better at home."

BUYER'S GUIDE TO PERSONAL COPIERS

BY MARK BITTMAN

AS MORE AND MORE PEOPLE
SET UP HOME OFFICES, COPIERS ARE MAKING
THEIR WAY INTO HOMES



Once upon a time there was carbon paper, which didn't work too badly. Sometime during recent history, though, we forgot how to use it. Offices across the country began sporting giant copying machines, made by the likes of Xerox and Kodak, and smaller but efficient copiers, made by Canon, Sharp, Ricoh, and a host of other companies. It was enough to spoil us forever; we now expect 20 good copies within a few hassle-free seconds.

Naturally, few of us who have set up home offices during the last five to 10 years were ready for a return to carbon paper. Instead, we made frequent trips to the copy store and library, used our spouse's office copier, or saved up our copies for trips to our own out-of-the-home workplaces. While we might have appreciated a copying machine at home, there were too many drawbacks: price, weight, size, and, of course, maintenance.

COPIERS GO HOME

Five years ago, however, Canon USA introduced an alternative: the "personal cartridge copier system," otherwise known as the personal (or portable) copier. Spending \$23 million on promotion in 1983 alone, Canon filled a need and seized a market that sent its competitors scrambling.

Today, roughly a half dozen manufacturers produce

and sell personal copiers, to the tune of 213,000 units in 1986. Most of these machines are aimed not at the small-business market but at the home-office market. "When I began making three trips a day to the printer to use his copier, I realized I needed a copier in my office," says John Champion of Oyster Point Construction, his New Haven, Connecticut-based company. "There were times I needed a copy for my carpenter, one for my files, and one for the customer. Sometimes I ran multiple copies on my computer's printer, but that was getting ridiculous."

PERSONAL COPIERS DEFINED

Dataquest, a San Jose, California-based consulting firm, has defined the category of personal copiers to encompass those that are compact, lightweight (many weigh less than 35 pounds), and fit on a tabletop. They have moving platens, single-size paper storage cassettes, an average monthly copy volume of 400, copy speeds of up to 12 per minute, and a retail price of \$1,100 or less.

Furthermore, according to Dataquest, machines for home-office use should have minimal features, be easy to install, and must offer superior reliability. This last feature, says Monica David, a senior vice president and director of the office equipment group with Dataquest, "is the key. If a copier isn't practically service free, then it shouldn't be in the category."

Most manufacturers have hastened to go along with Dataquest's approach. Toshiba, however, according to

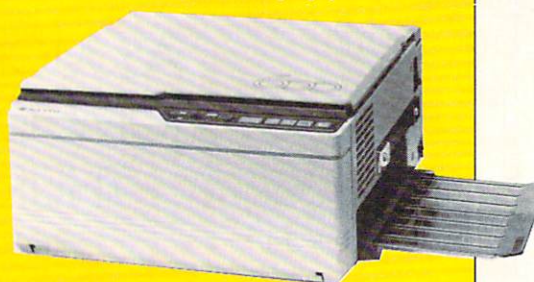
Canon's PC-5: Carries a suggested retail price of \$845 and has a 50-sheet multi-stack feed and multiple-copy capability. Canon's PC-5L can copy legal-size documents and lists for \$995.



Minolta's EP-50: Minolta's entry, at \$1,295, has a host of desirable features—automatic sheet feed from a 100-sheet cassette as well as single-sheet bypass; legal-size paper handling; a speed of 10 copies per minute; and a cartridge with a life of up to 30,000 copies.



Sanyo's SFT 600: Costs \$895 and, like the Canon PC-3, comes with a handle, though it weighs nearly 40 pounds compared to the PC-3's 25.5 pounds. It is, however, significantly faster than the PC-3 and comes with an 80-sheet paper cassette. The SFT 605 handles legal paper.



company spokesman John Lesser, has found that a high proportion of those copiers designed for office use are finding their way into the office at home and has capitalized on this situation by promoting the BD-3110, its low-end office model, for home use. The major difference is its somewhat more demanding maintenance. And on the low end, a couple of manufacturers, such as Sharp Electronics and Plus USA Corporation, are selling hand-held copiers. Sharp's hand-held copier costs \$190 and will reproduce documents on 3.5-inch-wide thermal paper; Plus USA's copiers cost \$250 and \$400 and copy onto 2-inch-wide and 4-inch-wide paper.

John Champion, like so many others who make fewer than 10 copies per day, started out with the Canon PC-3, unquestionably the least complicated copier made and among the two or three least expensive. "And it was great," he says. "The only time I encountered a problem was when the paper wasn't fed in perfectly straight; then it got crunched."

Eventually, as his copy load increased slightly, Champion upgraded to the Toshiba BD-3110. "Without an automatic paper feed, making 10 copies of the same document was a real hassle, though it was still better than running to the store. And I really needed the legal-size copying capability," Champion explains.

All the machines that fit the Dataquest definition use a cartridge approach; the "consumables"—toner, for example—are very easy to replace. Canon's patented system,

based on a single cartridge that contains toner, a photo-sensitive drum, and a developer unit, is unique in its simplicity; the user doesn't even see the toner, let alone touch it.

THE MAJOR PLAYERS

That popular, no-mess, no-hassle maintenance, combined with the company's aggressive marketing stance, has allowed Canon to retain the lion's share of the market: It sold 165,000 of the 213,000 copiers sold in 1986.

But Canon's single cartridge, which must be replaced every 1,500 copies and costs about \$85 for black (color cartridges cost \$90 each), is relatively expensive. Ted Morikawa, manager of Canon's personal copier division, agrees: "The two-cartridge systems of our competitors are less expensive on a per-copy basis. But if you're working at home on the weekend or after five o'clock, you're willing to pay for convenience and quality."

Also, the initial cost for a Canon PC-3 copier—a 25.5-pounder that is capable of color copying, comes in four bright colors, and has a carrying handle—is almost surprisingly low: It lists for \$695 and can be found for less than \$500. Naturally, the machine is about as bare bones as they come: Paper—from business card to letter-size only—is fed in manually, meaning that each copy must be attended personally. Canon, of course, also offers a line of personal copiers that offer more sophisticated features than those of the PC-3.

Canon's competition includes other Japanese heavy hitters such as Sharp (a strong number two with 13 percent of the 1986 market), Sanyo, and Minolta; Panasonic has also made recent introductions. The company's Apogee costs about \$800 and weighs 12 pounds; it will be available this year.

All of these machines have a two-cartridge system, which typically requires toner addition every 5,000 copies and limits drum replacement to every 10,000 to 15,000 copies. (A notable exception is the Toshiba copier that requires drum replacement after 50,000 to 60,000 copies.) This makes the Toshiba copier's per-copy cost lower than that of Canon's and reduces the frequency of maintenance, though it does make maintenance potentially more messy. Most of these copiers also feature interchangeable color cassettes, the ability to copy from books and other objects, automatic paper feed and multiple copying (usually up to 20 automatic copies per original), and speeds of five to 10 copies per minute.

The chart on the opposite page details some of the best personal copiers available today. ■

SHOPPING FOR A PERSONAL COPIER: A CHECKLIST

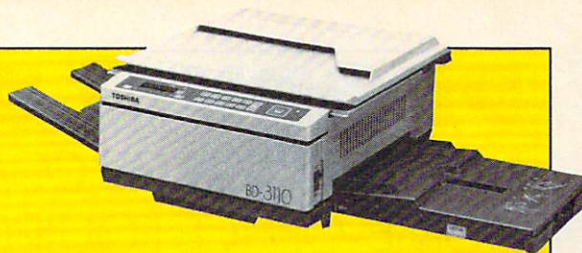
Before you go out and buy a copier for your home office, ask yourself these questions. Your answers will help you determine which features you need most.

- Why do you need a personal copier?
- Will anyone else be using it besides you?
- Do you care whether or not the copier blends in with the decor of your home office?
- How much are you willing to spend?
- Where will you put it?
- Will you be moving the machine around quite a bit?
- How much space can you allot for a copy machine?
- Will you have to make legal copies?
- Will you have to reduce or enlarge documents?
- Is copy speed critical?
- Will you need multiple copies of many documents?
- Are you concerned with hassle-free maintenance?
- What kind of warranty do you want?



Sharp's Z-55: Features not only an interchangeable color cartridge system but also automatic paper feed for both letter-size and legal-size paper. With a \$949 list price, it should prove to be a good step up for many users.

Ricoh's R1PRO jr.: Comes with a built-in 100-sheet paper cassette and prints in four colors. Though the R1PRO jr. won't handle legal-size paper, the company's more sophisticated model, the R1PRO, will make copies from 10-inch-by-14-inch paper. The R1PRO lists for \$1,465 and copies in only black and brown; the jr., which will make copies in four colors, costs \$1,325.



The Toshiba BD-3110: Lists for \$1,545, but often sells for less than \$1,000 at discounted retail. Though it is essentially a small-business copier, it has been selling well in the home-office market. It will handle legal-size paper, has adjustable exposure, and copies at a speed of 10 sheets per minute. Owners can purchase yearly service contracts for \$100 to \$300 from authorized dealers.

BUYER'S GUIDE TO PERSONAL COPIERS

Copier	Manufacturer Address Phone	Price	Weight (lbs.)	Copy Speed*	Auto Paper Feed?	Multiple Copies?	Colored Copies?	Legal-Size Paper?	Handle?	Adjustable Exposure?	Cost Per Copy?	Warranty?
Canon PC-3	Canon USA, Inc. One Canon Plaza Lake Success, NY 11042 (516) 488-6700 or (800) OKCANON	\$695	25.5	14 sec., 4/min.	No	No	Yes	No	Yes	Yes	5¢	90 days parts and labor; 15 days for cartridge
Canon PC-5	(see address and phone number above)	\$845	26	14 sec., 6/min.	Yes	Yes	Yes	No	No	Yes	5.5¢	90 days parts and labor; 15 days for cartridge
Canon PC-5L	(see address and phone number above)	\$995	26.5	14 sec., 5/min.	Yes	Yes	Yes	Yes	No	Yes	5.5¢	90 days parts and labor; 15 days for cartridge
Minolta EP-50	Minolta Corp. 101 Williams Dr. Ramsey, NJ 07446 (201) 825-4000	\$1,295	55	11 sec., 10/min.	Yes	Yes	Yes	Yes	No	Yes	N/A	None
R1PRO jr.	Ricoh Corp. #5 Dedrick Place West Caldwell, NJ 07006 (201) 882-2000	\$1,325	44	10 sec., 8/min.	Yes	Yes	Yes	No	No	Yes	N/A	90 days parts and labor after installation; or 150 days parts and labor after shipment
R1PRO	(see address and phone number above)	\$1,465	59.5	7.5 sec., 10/min.	Yes	Yes	Yes	Yes	No	Yes	N/A	90 days parts and labor after installation; or 150 days parts and labor after shipment
Sanyo SFT 600	Sanyo Business Systems 51 Joseph St. Moonachie, NJ 07074 (201) 440-9300	\$895	39	8.5 sec., 10/min.	Yes	Yes	Yes	No	Yes	Yes	N/A	90 days or 500 copies for drum and cartridge
Sanyo SFT 605	(see address and phone number above)	\$1,145	43	8.5 sec., 8/min.	Yes	Yes	Yes	Yes	Yes	Yes	N/A	90 days or 500 copies for drum and cartridge
Sharp Z-55	Sharp Electronics Corp. Sharp Plaza Mahwah, NJ 07430 (201) 529-8200	\$949	35	11 sec., 8/min.	Yes	Yes	Yes	Yes	No	Yes	2.3¢	90 days parts and labor; 15 days for cartridge
Toshiba BD-3110	Toshiba America, Inc. 9740 Irvine Blvd. Irvine, CA 92718 (714) 583-3000	\$1,545	46	8 sec., 10/min.	Yes	Yes	Yes	Yes	No	Yes	2¢-3¢	6 months parts and labor

*The first rate refers to the time that it takes the copier to produce the first copy (this does not include warm-up time); the second figure indicates the subsequent number of copies produced per minute.

PRODUCT REVIEWS

EVALUATIONS OF COMPUTERS, PERIPHERALS, AND HOME-OFFICE EQUIPMENT

COMPUTERS & PERIPHERALS

Compaq Portable III

MANUFACTURER: Compaq Computer Corporation

ADDRESS: 20555 FM149, Houston, TX 77269; (713) 370-0670

PRICE: \$4,999 (20MB version), \$5,799 (40MB version)

By now, we're accustomed to nothing less than state-of-the-art compatibility, design, and execution from Compaq. In its five years of existence, Compaq has acquired a reputation for excellence in its MS-DOS computers, and the Compaq Portable III maintains this tradition. Compaq is proud to say that, despite the size and portability of the Portable III, it has all of the features (and then some) of a powerful IBM PC AT-compatible desktop computer.

A MIGHTY MITE

When packed for travel, the 20-pound Portable III measures 9.8-by-16-by-7.8 inches. The underside of the detached keyboard functions as the front panel of the packed machine.

The 5.25-inch floppy-disk drive is on the right side. Right beneath this drive is a hard-disk drive, available in 20MB or 40MB versions; both have extremely fast access times. The back panel of the unit contains connectors for the power line, an RGB monitor, and serial and parallel interfaces. In addition, there is a port for an optional expansion box that can be attached to the rear of the machine. The expansion box can hold two plug-in boards.

A sturdy, padded carrying handle is attached to the top of the case. For traveling, the Compaq fits nicely into an optional padded nylon bag (\$89) that has a shoulder strap.

The Portable III is powered by an 80286 microprocessor, the same chip found in the IBM PC AT and IBM PS/2 Models 50 and 60. Unlike the AT, however, the Portable III runs at a clock speed of 12MHz. (For clock-dependent software, the Compaq can be soft-switched to 8MHz, if necessary.)

The III's standard 640K of RAM may be expanded to 6.6MB



COMPAQ PORTABLE III SPECIFICATIONS

MICROPROCESSOR: Intel 80286 (12 MHz)

MEMORY: 640K

OPERATING SYSTEM: MS-DOS 3.0

WEIGHT: 20 pounds

DIMENSIONS: 9.8-by-16-by-7.8 inches

BUILT-IN PORTS: 2

EXPANSION SLOTS: Optional plug-on expansion unit (\$199) includes two full-size slots

DISK DRIVES: 5.25-inch and 20MB or 40MB hard-disk drive

GRAPHICS DISPLAY: Gas plasma

SOFTWARE INCLUDED: None

WARRANTY: One year

LIST PRICE: \$4,999-\$5,799

without requiring the expansion box. A real-time clock is included as standard equipment.

The orange-on-gray gas plasma display is capable of showing mixed text and graphics. You can adjust the brightness as the situation requires with a knob conveniently located on the front panel. And the screen can be easily tilted to a range of positions to reduce glare.

The keyboard is comprised of 84 keys, including a separate numeric keypad, a large L-shaped RETURN key, and 10 function keys arranged in a single horizontal row atop the main keyboard. The keys provide good tactile feedback. Various character sets may be loaded for foreign-language use.

DRAWBACKS

With the exception of the new Portable IV, Compaq has avoided using the increasingly popular 3.5-inch floppy-disk drive, saying that it wants to protect its customers' investments in 5.25-inch software media. The Portable III is no exception to this rule. Unfortunately, to the degree that the Portable

III is used as a portable machine, it suffers from the lack of the sturdier and more convenient 3.5-inch drives.

Its ability to compute on-the-go is also hampered by the lack of an independent power source. The computer must be plugged into a wall outlet. In short, the Portable III is not in the same league with the many laptops that can be used on trains and airplanes.

Because Compaq has always targeted its computers at the corporate market—implying a certain level of service and backup—the computers are expensive. The Portable III has a list price of \$4,999 and \$5,799 for the 20MB and 40MB hard-disk versions, respectively. For the money, you get the assurance of buying from a strong and stable MS-DOS manufacturer.

WHO WILL BUY?

In spite of various drawbacks and the fact that many MS-DOS computers are available now for less than \$1,000, there are good reasons for a professional to pay four times that amount for the Portable III.

Processing Speed. Any computation-intensive applications such as spreadsheet manipulations will run faster on the Portable III than on almost any other non-80386 MS-DOS computer. With a *Norton Utilities* speed-index rating of 10.1, the Portable III is roughly 10 times as fast as the original IBM PC and nearly twice as fast as a Tandy 4000 with 1MB.

Compatibility. Microsoft's OS/2 operating system, which allows multitasking, requires an 80286 microprocessor in order to run. Although third-party vendors will supply plug-in boards to upgrade existing PC-level and XT-level MS-DOS computers, there's something to be said for buying the real thing. At the same time, given the increasingly high quality of MS-DOS software, many small businesses and home offices may never need to upgrade.

High-Powered Portability. Many nine-to-fivers like to bring their work home from the office. ➔

Make Any Computer Do Exactly What You Want With McGraw-Hill's

Contemporary Programming & Software Design Series



From Writing Your Own Programs to Modifying Existing Software, Here's the New, Easy, and Low Cost Way to Unlock the Secrets of Your Computer

Whether you use computers for business, for personal applications, or for fun, off-the-shelf programs will never do everything you want them to do for you. That's because they were written by programmers to satisfy what they perceived as the needs of the greatest number of potential users—often missing some or many of your specific needs.

That's why McGraw-Hill's new Contemporary Programming and Software Design Series teaches you how to create your own software... either from scratch or by making key modifications to existing programs.

There is nothing magical about it. You learn the process of building a computer program step-by-step with McGraw-Hill *Concept Modules* sent to you one at a time, once a month. Each of the ten modules in the Series takes you through an important step in the development of the structure and detailed logic of a program, including testing, debugging, and documentation.

Unique Interactive Hands-On Instruction

Each module includes an easy-to-understand guide PLUS a 5¼" floppy disk containing typical programs and interactive instruction that you can run on Commodore 64 and 128 computers, IBM PCs and PC compatibles for hands-on experience.

In the first Module, for example, when your sample program (Declining Interest Loans) appears on your screen, you'll find errors on certain program lines. You'll also see that the program is only three-quarters completed.

Now comes the fun part. You'll discover how this program is built, and in the process you'll learn how to identify and correct errors. And by the end of Module 1, you'll actually have completed this program yourself.

But there's more. Special graphics on your screen work in conjunction with the accompanying guide to amplify, illustrate, and deepen your understanding of software design principles.



Make no mistake. Almost all books and courses on "programming" teach you only the final 5% of the total programming process—namely, how to code in a specific language... information of little value if you don't know how to reach the point in the programming process when you are ready to code.

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Build Your Own Personal Software Library

The sample programs you work with throughout the Series are excellent learning tools. But they're more than that. By combining the sample programs onto one master disk, you'll have the start of your own personal software library. In addition to the programs you've written and modified throughout the Series, you'll also receive dozens of the most popular public domain and user-supported programs, such as data base manager, word processor, calendar generator, appointments reminder and much, much more.

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If someone has beaten you to the card, write to us for ordering information about the Contemporary Programming and Software Design Series.

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PRODUCT REVIEWS

For those with high computational or memory requirements, the Portable III has obvious advantages. Other professionals who might find the III useful include consultants and salespeople or those who spend time working in more than one place.

Elegance upon Arrival. No doubt about it—the Portable III makes a statement when it arrives, similar to one made by a pricey German automobile. People who do their computing in the presence of their customers will want to keep this in mind.

AN OBJECT TO COVET

The Compaq Portable III is a welcome addition to the world of MS-DOS computers, offering an unrivaled combination of small size, portability, and power in its price range. In an ideal world, we might wish for a 3.5-inch floppy-disk drive, a portable power supply, and half the weight. But such small considerations will not prevent many MS-DOS computer owners from coveting such an attractive machine. Unfortunately, the Portable III's relatively high price will leave many of them dreaming.

—DAVID WILSON

CIRCLE READER SERVICE 100

Tandy 1000 HX

MANUFACTURER: Tandy Corporation
ADDRESS: One Tandy Center, Fort Worth, TX 76102; (817) 390-3011
PRICE: \$699

The Tandy 1000 HX follows in the footsteps of the older Tandy 1000 EX, with a one-piece keyboard/disk-drive/CPU design. But the similarity ends there. The improvements in the HX show that Tandy has been listening to complaints about the EX's shortcomings and thinking about some innovations.

The first change—and probably the most impressive—is putting the operating system in ROM. The basic HX configuration has only one drive, and the constant disk swapping of a one-drive system can be annoying. With DOS already loaded and the new larger capacity 3.5-inch disks (720K versus 360K), a one-disk-drive system becomes practical. For example, a word processing program I use needs a minimum of 306K to work properly. Running it on the old EX left a mere 54K of usable work space or about 25 pages. Contrast that



TANDY HX SPECIFICATIONS

MICROPROCESSOR: Intel 8088 (7.16/4.77MHz)
MEMORY: 256K, expandable to 640K
OPERATING SYSTEM: MS-DOS 2.11 in ROM
BUILT-IN PORTS: 5
EXPANSION SLOTS: 1 (accepts 3 PLUS expansion boards)
DISK DRIVES: One 3.5-inch disk drive
SOFTWARE INCLUDED: MS-DOS version 2.11, GW BASIC 2.02, *Personal DeskMate 2*
WARRANTY: 90 days
LIST PRICE: \$699

with the same program on a 3.5-inch disk and I have more than 400K left in which to work.

That is not to say that having two disk drives isn't preferable, and, in that light, the HX shows another key improvement over the EX. The 5.25-inch drive that was built into the EX was mounted on the side. I always found it a nuisance because I couldn't see the drive activity light. The HX fixes that problem. The much smaller 3.5-inch drive is front mounted, and there is room for a second internal disk drive. (The additional drive on the EX was externally mounted.)

Once you turn on the HX, a menu is automatically displayed, allowing you numerous options, such as setting the time and date and running *Personal DeskMate 2* or any other program on the A drive. You can use the default settings supplied by Tandy or a setup program that lets you tailor the system to your needs.

Like the EX, the HX still has limited expansion. It can use only the PLUS expansion boards and is limited to three. At this point, DOS version 2.11 is supplied in ROM, and

Tandy won't say if it has plans to offer a ROM-based upgrade. *Personal DeskMate 2*, which is bundled with the computer, is a good guide for learning the basic applications of computing—word processing, spreadsheets, databases, and telecommunications, for example. The program has become too complex to emulate the "graphical user interface" standard made popular by the Macintosh. I am still a fan of the old *DeskMate* with its simpler format.

After a year of using Tandy machines almost exclusively, I've gotten used to its non-IBM standard keyboards. My one remaining complaint about the Tandy keyboard is that the ALT key should be moved to a location more easily reached by touch-typists who hate to remove their hands from the home row of keys.

Aside from these few minor complaints, I am impressed with the Tandy 1000 HX. While Tandy is marketing this system to the home and school markets, I see no reason at all why the owner of a small business, on a tight budget, wouldn't look seriously at this computer as a cost-effective way of getting into MS-DOS computing. Even for a large business, it might serve as an inexpensive workstation on a local area network.

—STEPHEN MILLER

EDITOR'S NOTE: Look for a review of the Tandy 1000 TX in next month's *Product Reviews*.

CIRCLE READER SERVICE 101

SP-1200AI Dot-Matrix Printer

MANUFACTURER: Seikosha America Inc.
ADDRESS: 1111 Macarthur Blvd., Mahwah, NJ 07430; (201) 529-4655, (800) 422-7768
HARDWARE REQUIREMENTS: Amiga, Apple, Atari ST, IBM PC or compatible
PRICE: \$319

For the person who doesn't mind dot-matrix printouts or the time spent waiting for documents to print, the Seikosha SP-1200AI might be a pretty nifty deal at only \$319. Although the SP-1200AI 9-pin dot-matrix printer produces copy at a tedious 120 characters per second (cps) in draft mode and 25 cps in near-letter-quality mode, its pitch selection inspires you to spruce up your printouts.

The printer's character-pitch setting function was impressive; I was able to print copies in pica (10 char-

acters per inch), elite (12 cpi), condensed (17 cpi), condensed elite (20 cpi), and proportional type. The pitch types could serve various functions; for instance, the home-business worker might create a more appealing memo format with condensed type. Students also will find that the 1200AI meets most of their school needs. Again, though users might initially be disappointed by the printer's speed, I feel they'll be swayed by its capabilities and price.

Besides the printer's relative slowness, my only other gripe with it was the "techie" manual. The manual is written for those who understand BASIC and plan to program their software to utilize the printer's functions. This is fine and necessary, but the manual lacks easy-to-follow, step-by-step instructions for non-techies and newcomers to computing.

The 1200AI's printing capabilities include double-width characters, superscripts and subscripts, underlining, emphasized (or bold) printing, italics, double-strike (enhanced) printing, page-length setting, horizontal and vertical tab setting, margin setting, and graphics printing.

The Epson-compatible 1200AI is part of Seikosha's SP-1200 printer series, which also includes printers that are compatible with the Commodore. The printer weighs 11.2 pounds and has a 2.3K buffer.

—STEPHANIE ESTERS

CIRCLE READER SERVICE 102

HOME-OFFICE EQUIPMENT

Toshiba Personal Facsimile Model 30100

MANUFACTURER: Toshiba America, Inc.
ADDRESS: 9740 Irvine Blvd., Irvine, CA 92718; (714) 583-3000
PRICE: \$1,995



Toshiba's Personal Facsimile Model 30100.

Now that I've evaluated a few personal facsimile phones—that is, the breed of fax phones that cost between \$1,500 and \$2,000 and are appropriate for home offices and small businesses—I feel qualified to

make this general statement: Most personal fax phones are basically the same except for some minor details. Just as televisions within a particular price range are very similar, personal facsimile phones have many of the same features.

The \$1,995 Toshiba Personal Facsimile Model 30100 is no exception. Like other personal fax phones, the Toshiba unit doubles as a copier, includes a full-featured telephone, has a liquid crystal display, is easy to set up and operate, can send documents up to 8.5 inches in width, and uses thermal-coated paper. While I found the Toshiba to be more attractive, sturdier, and a bit faster than, say, the Canon Faxphone 10, I couldn't find any significant differences.

For those of you who aren't familiar with personal fax phones, I'll explain how easy the Toshiba Model 30100 is to use. I pulled the machine out of the box, plugged it into an electrical outlet and a telephone jack, installed the thermal paper that came with the unit, and then turned on the machine. Then I set the date and time and stored my user name and telephone number (I needed the manual to do this), and my fax phone was ready to send and receive documents.

The Toshiba fax phone will transmit documents that measure between 5-inches and 8.5-inches wide to another fax unit or fax board. (Documents that are smaller than the minimal size can be inserted in a special carrier sheet that comes with the unit.) Toshiba boasts a transmission speed of up to 15 seconds per page, depending on the type of facsimile machine on the receiving end. And the fax phone can receive documents from any other G2/G3-type unit or fax board.

The Toshiba unit also will store and automatically dial up to 50 telephone and 50 facsimile numbers, and it will let you print out records of past transmissions.

The copier will make single copies of documents onto thermal paper. As with the copiers included on other personal fax phones, this copier made somewhat blurry reproductions on thermal paper.

Once it's been set up, people who have never operated a facsimile machine before will be able to operate the Toshiba Model 30100 without picking up a manual.

—BERNADETTE GREY

CIRCLE READER SERVICE 103

LifeSet Headset

MANUFACTURER: Plantronics, Inc.
ADDRESS: 345 Encinal Street, Santa Cruz, CA 95060; (408) 426-5858;
(800) 538-0748, ext. 1400; (800) 662-3902, ext. 1400 (in CA)
PRICE: \$140



Plantronics' latest telephone headset.

Whether you're a telemarketer, an insurance broker or stockbroker, or another home-based professional, your telephone could be the most vital hardware in your office. It could also be the most cumbersome. Wouldn't it be ideal if while talking on the phone, you could free both hands to take notes, reach for documents, or type at your computer? While cradling the phone against your shoulder is a solution for many, it's a prime cause of muscle tension.

Plantronics, a developer of telephone headsets, has recently introduced the LiteSet Headset, a three-inch long capsule that perches in your ear. (Because everyone's ears are different, Plantronics gives you a choice of nine different earpieces.) The capsule connects to a small adapter that can easily be fitted to most standard telephones. An attached five-foot long cord allows you to move about your office space easily. It also features a three-position volume-control switch, which is helpful for bad phone lines.

While the LiteSet helped me get rid of the crick in my neck, it gave me a pain in my ear. The receiver was so close to my ear that it caused a buzzing sensation, especially when the volume was turned up.

While the price seemed high, if you use the phone several hours a day and need your hands free, the LiteSet Headset could be a helpful office addition.

—AMAL MORCOS

CIRCLE READER SERVICE 104

USING HYPERCARD

A CONVERSATION WITH BILL ATKINSON: THE MAN BEHIND HYPERCARD

BY DAVID HALLERMAN

When *HyperCard* was unveiled to the world at last August's MacWorld Expo in Boston, many industry observers hailed it as revolutionary. Yet because Apple now bundles the multifaceted program with every new Macintosh, the introduction of *HyperCard* almost brewed a revolution, too, among some Mac software developers, who felt that the success of their programs was being threatened.

What kind of software package generates such strong responses?

As with many influential creations, the basic idea behind *HyperCard* is simple. The files you create with the *HyperCard* application are called *stacks* (as in a stack of index cards) or *stackware*. Each screen in a stack represents one card, and each card can contain text or numbers in fields (like a database or word processor), graphics (like a paint program), sound effects and music, and buttons that you click on with the mouse to control the stack. One common use for buttons is linking various cards based on your own associations. For instance, if you had a stack that detailed all the parts of a car with one card per part, you could click on the "bolt" button to take you to the various bolts and their descriptions.

HyperCard comes with various stacks, including a very useful Rolodex-like name-and-address application that also dials the phone. But, as I wrote in last month's review, "*HyperCard* is a chameleon that can take on whatever color is needed." What you use to color your own stacks is the built-in programming language called HyperTalk. By letting you write scripts (lists of instructions) in plain English, HyperTalk helps bring the full power of the Macintosh to non-programmers.

Our initial reviews of *HyperCard* have been so enthusiastic, we've decided to bring ongoing coverage of *HyperCard* to our readers, beginning this month in the Using *HyperCard* department. We thought it best to introduce the department by asking



Pictured here is ace programmer Bill Atkinson—the self-described "spiritual leader" for Apple's *HyperCard* team—using a pseudonym in a sample stack.

Bill Atkinson—*HyperCard*'s major architect—a few questions about its creation, its present use, and its future possibilities. In the upcoming months, we will present a regular tutorial on using HyperTalk along with various *HyperCard* tips and information on the hottest, most fascinating stackware packages around.

After the MacWorld show, I caught up with Atkinson, creator of the classic *MacPaint* program and self-described "spiritual leader" for Apple's *HyperCard* team. Atkinson's natural enthusiasm and humor burst through the phone wires as he talked about computing, the Macintosh, and *HyperCard*; he enjoys flavoring his speech with other voices and strong inflections. The 36-year-old Apple Fellow—a 10-year employee of the company—lives with his wife and daughter a half mile from where he grew up in Los Gatos, California.

How would you describe *HyperCard*?

If I'm asked, "What is *HyperCard*?" It's a software Erector Set . . . for organizing information and what amounts to writing programs. And this Erector Set has a minimal structure, so that it's capable of supporting a wide variety of information. That's what it's very good at. This metaphor of cards in stacks, and the cards having buttons and text and graphics, seems to be sufficiently

simple that people can learn it and sufficiently powerful that a lot of different kinds of information can be handled.

So much of *HyperCard* entails customizing this and that.

Oh yes. You make this stack, and it doesn't do exactly what you want, so you tweak it and play with it a bit. You know, you've got a working Rolodex that you're using, and you want some other feature that isn't there. So you copy and paste a button—and it's there and you get the idea that, "Oh, this stuff, I can do this." You need to get those small victories very early on . . . each step has to be small and rewarding.

And complete.

Right! You've got to be able to stop at that point and not be dangling. You can use the Rolodex and add cards to it. It's a nice chunk of learning that people can stop at and not feel like they're halfway between lessons.

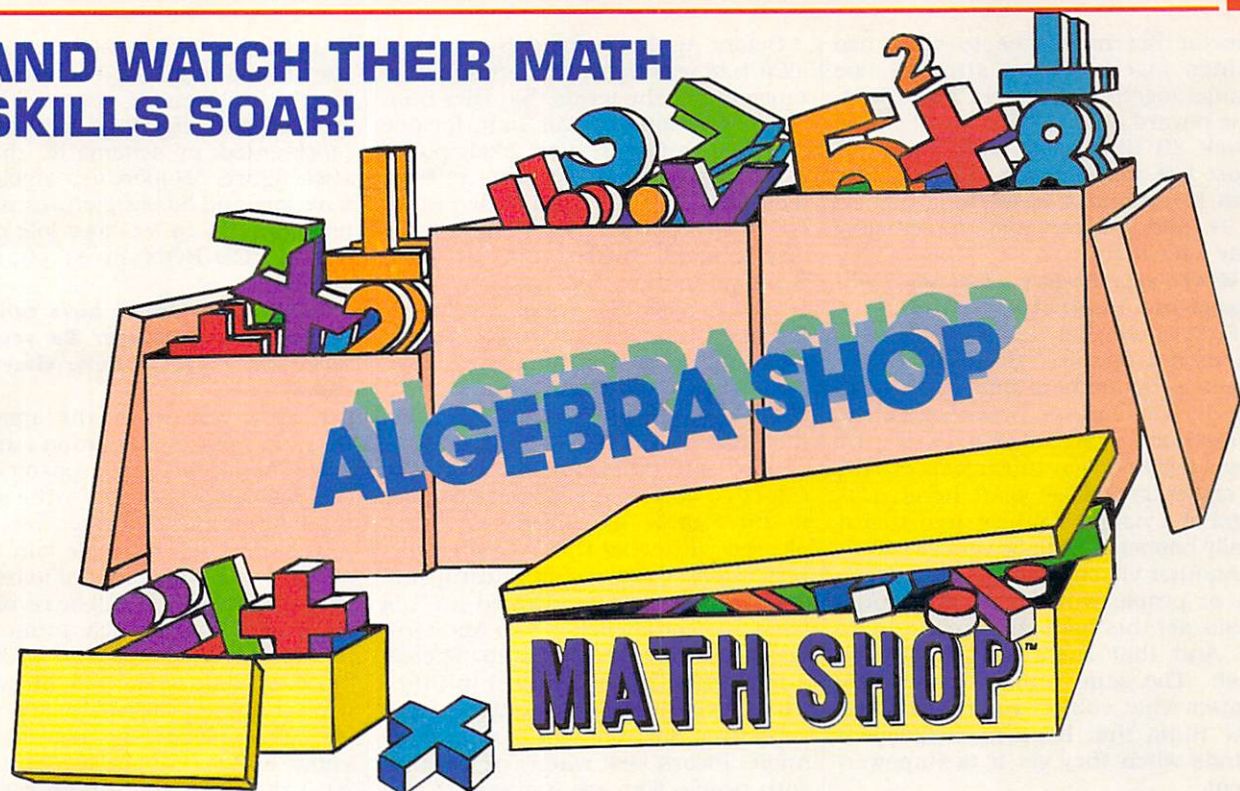
Not just learning, though, but you can be using it from day one.

Like when you buy an Erector Set, it has these models in the brochure, but you have to build them. The difference here, these are working models. And you don't start by building them and then using them. You start by using them, and then by looking inside them. The very first act in an

DAVID HALLERMAN is a senior editor for FAMILY & HOME-OFFICE COMPUTING.

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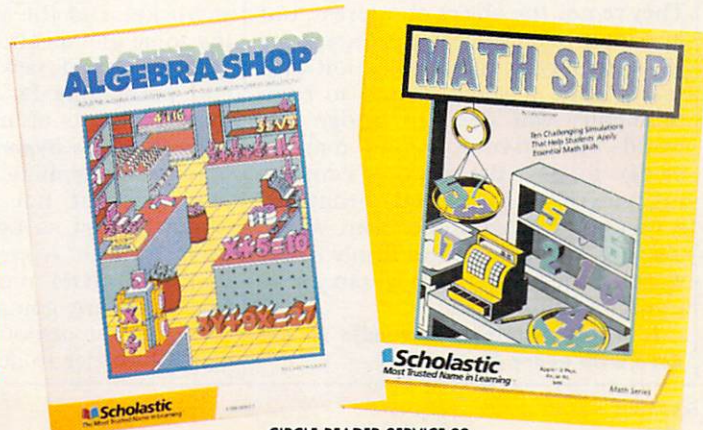
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USING HYPERCARD

Erector Set has to be to stick two things together. And sticking two things together isn't very rewarding. The reward doesn't come until you've stuck 30 things together. Here it's more like we ship you this big crate that has a bunch of working models in it, and you can just immediately play with them.

What's your fantasy about what will happen as a result of HyperCard?

First of all, that it will greatly soften, if not dissolve, the barriers between programmers and the rest of us. It will sort of break open the priesthood. Instead of in Latin, the mass will be given in English. That's a rather grandiose plan here. It is kind of a vision. To the extent that it really happens, I will be very gratified.

Another vision that I have is that a lot of people will, on an individual basis, get this rush of, 'Wow! I can do it!' And that rush is the teaching rush. The same thing happens no matter what subject you're teaching. The thing that happens in people's minds when they get it is empowerment.

'I can do this' is essential to all learning. Anything. 'I'm empowered to multiply numbers now because I've finally learned my times tables.' My vision includes a lot of that. Different people will be empowered to do different things, because each of us has different things we want to achieve. It all sounds real corny and syrupy when I say it, but I do think about those things.

Were you ever a teacher?

I feel like a teacher. I like to teach. I feel the role that I play at Apple is kind of a cross between an inventor, an artist, and a teacher. And all of those three people are doing the same basic job of communicating. They kind of have to work together a little to reach people through their hearts and not just their brains.

I've always had what I consider a healthy disrespect for computers. They're not the object of interest, but just tools to do something. Part of my job is to stay in communication with real people. If you're trying to communicate, you need to bridge two worlds. If you're trying to make a bridge to, say, the world of computing, you've got to be good at that. I'm a very good programmer. But you've also got to have your feet firmly in the world of the person with whom you're trying to communicate.

Is Apple required to bundle HyperCard with every Mac?

Before Apple accepted *HyperCard*, all it had was the right of first acceptance under the terms that they bundle it. The concern was that, for one reason or another, most likely political, Apple would choose not to bundle *HyperCard*, in which case I needed some protection. That's the arrangement I worked out with John Sculley [Apple's chief executive officer], that basically, 'Okay, I will work my hardest and do my best here and make the most beautiful thing I can and, since you guys can't write a blank check, I can't ask you to bundle it. What I will ask is that if you choose not to bundle it, that the rights go back to me so that I can get it out.' Apple has been very, very pleased with what they've gotten. It's very important to Apple's future success. John feels vindicated in his trust and confidence in me. And I feel justified in my trust in John. There's a real vision there. And I think that without that vision, I wouldn't have a supportive environment to work in at Apple. I work best when I'm working with people who are rooting for me, who are working with me.

Could you elaborate on HyperCard's use as a 'front end' for CD-ROM or other CD products?

The big thing that CD-ROM brings to the picture is just volume. It's nothing new, except lots [more]. Which is something new. Anytime there's a factor of 10 different in anything, it fundamentally changes what is.

It changes quality, not just quantity.

That's right. The spreadsheet was nothing new compared to a calculator and pencil, except that it was enough faster that you could start trying different things, and then it really was something quite new. What's going to happen with CD-ROM is people are going to [say]... 'Wait a minute! A half a gigabyte on a little plastic platter?' Suddenly the availability of information is going to skyrocket. But the accessibility is going to be just as stuck as ever. You're going to need new user interfaces and paradigms for getting at enormous amounts of information.

That's where HyperCard comes in.

Yes. If a telephone book was in *HyperCard*, but not alphabetized, it would be just as useful as one that was. I think *HyperCard* will help make CD-ROM more useful. Also, CD-ROMs are going to help *HyperCard* for one obvious reason: *HyperCard*, in order to get the richness of

display, has deliberately chosen to use bit-maps for its representation, for the richness of scanned images and detailed drawings that can't be represented in schematic, drawlike stick figures. *HyperCard* stacks that have lots and lots of pictures in them tend to take up lots and lots of disk space. [CD-ROM gives them the space.]

Some commentators have called HyperCard 'revolutionary.' Do you think that term is hyperbolic or close to the truth?

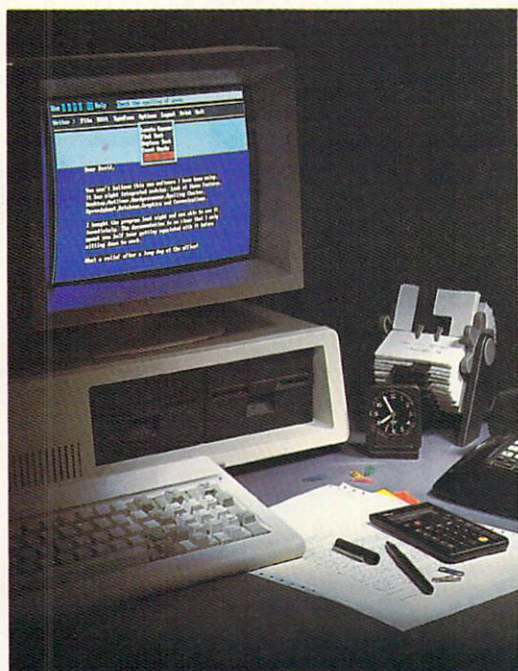
I think we'll know the answer to that in a year. A revolution isn't one-sided. You don't put a poster up on the wall and say 'Here's the revolution.' A revolution is only a revolution to the extent that people join it. *HyperCard* has the potential to be a revolution. Whether it will be revolutionary or not is very much a function of how people receive it and what they build with it, what they do with it, what it does to their lives. My bet... is that [people] will get behind it. You know, just sort of like the early, early returns from New Hampshire, the early returns have been very rewarding to me.

If it's going to be a revolution, it needs to be bigger than Apple. It needs to, in a major way, up the expectations for what computers should be like. I think it has some pieces that do that, that have the potential to do that if they're well received. It has the potential to break sort of a tyranny of software. That is, 'If the program ain't the way that we wrote it, you can't change it.' That's gone in an irrevocable fashion. Once people get hooked on customizability...

... they'll want it in other programs.

It's just like once people get hooked on graphics, even IBM has to bend toward that, you know, and say 'Okay, people want graphics, let's give them graphics.' I think that a number of people who grow up on *HyperCard* and its descendants—*HyperCard* is not the end-all and be-all, it's just sort of a direction I believe in—will not settle for less. I would expect that in order for *HyperCard* really to be a revolution, that it lead in several different ways in bringing up the whole state-of-the-art or expectation of what a personal computer is. 'What is a personal computer?' [It] should really be much more interactive. And 'What is personal-computer software?' The expectations will be set for more customizability. ■

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SOFTWARE GUIDE

Welcome to FAMILY & HOME-OFFICE COMPUTING's Software Guide. The following table relates to the review charts that follow. It lists the various types of computers as designated under "hardware requirements" (and other hardware designations in this issue), the models included under each designation, and the minimum memory requirement (unless otherwise indicated).

DESIGNATION	MODELS	MINIMUM MEMORY
Amiga	500, 1000, 2000	512K
Apple	II, II Plus, IIe, IIc, IIgs (in IIe/c mode)	48K
64K Apple	II Plus, IIe, IIc, IIgs (in IIe/c mode)	64K
128K Apple	IIe, IIc, IIgs (in IIe/c mode)	128K
Apple IIgs	IIgs only	512K
Atari	800, 600XL, 65XE, 130XE	48K
Atari ST	520ST, 1040ST, MegaST	512K
C 64/128	C 64, C 128 (in 64 mode)	64K
C 128	C 128 only	128K
IBM PC	PC, XT, AT, PS/2, and compatibles	256K
Macintosh	128K, 512K, Plus, SE, II	128K
Tandy CoCo	2, 3	64K

Please note: All Apple designations (except for IIgs) include compatibles such as the Laser 128 or Franklin 2100. Any additional hardware listed is required unless noted as "recommended" or "optional." In many cases, "2nd drive" refers to either a floppy-disk drive or hard-disk drive. KEY: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user. **PS** = Play system (in the Entertainment reviews), the quality of the game's design and its playability. **GQ** = Graphics quality, evaluated in light of each model's graphics capabilities. **EU** = Ease of use after the initial learning period; varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	CP	Ratings						
				O	D	EH	GQ	EU	V	
BAKER'S DOZEN ButtonWare, Inc. P.O. Box 5786 Bellevue, WA 98006 (206) 454-0479 \$65 ©1987	This goes the traditional baker one better, with 14 handy utilities. My favorites were a mini-spreadsheet (useful for day-to-day calculations), a file locator (especially welcomed by hard-drive users), and a disk editor (for DOS experts). —CIRULLO	IBM PC.* 2nd drive.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★	
GEOWRITE WORKSHOP Berkeley Softworks 2150 Shattuck Ave. Berkeley, CA 94704 (415) 644-0883 \$50 ©1986, 1987	A greatly enhanced word processor that works with GEOS, the icon-based system for the C 64/128. You can get laser-printed documents even without a laser printer (just upload your files to the publisher via modem). But no spelling checker.† —HUNT	C 64/128. GEOS 1.2, joystick or mouse.	Y	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★	
MACATLAS MicroMaps P.O. Box 757 Lambertville, NJ 08530 (609) 397-1611 \$49 (Paint); \$199 (Prof.) ©1987	International and national maps that come in two versions: Professional (in draw format; best for desktop publishing) and Paint (for MacPaint and the like). Professional includes maps of each state with counties. Very helpful for papers and presentations, but expensive. —HALLERMAN	Macintosh. 512K, 2nd drive recommended.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★	
PRINTRIX Data Transforms, Inc. 616 Washington St. Denver, CO 80203 (303) 832-1501 \$65-\$165 ©1986, 1987	Take text from most word processors and graphics in one of three standard types, insert formatting commands, and print using a range of fonts. However good the print quality, it's not recommended because of cumbersome commands. —SOLOMON	Reviewed on 128K Apple. Also for 384K IBM PC.* More than 150 printers supported.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	D	★ ★ ★ ★	
PRO STAFF 3-D SPREADSHEET ShareData, Inc. 7400 W. Detroit St., #170 Chandler, AZ 85226 (602) 961-7519 \$40 ©1986	While this reasonably priced spreadsheet (part of the Pro Staff series; see below) may limit you to worksheets of only 255 columns by 255 rows, it also lets you link multiple worksheets, increasing its utility for home or small business. —ZORNBERG	IBM PC.* 2nd drive optional.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★	
PRO STAFF DATA ORGANIZER ShareData, Inc. (see above for address and phone) \$40 ©1986	Makes designing a database simple—just put each field in the desired location. Several field types include alphanumeric, money, date, and time, as well as a large text field for notes. With a report generator, too, this filer is a solid bargain. —ZORNBERG	IBM PC.* 2nd drive optional.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★	

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; **○** Poor; **★** Average; **★★** Good; **★★★** Very Good; **★★★★** Excellent; N/A Not applicable; E Easy; A Average; D Difficult; **CP** Copy protected, yes or no; † Longer review follows chart
*Titles listed for the IBM PC will also run on most IBM PC compatibles (as well as the IBM PS/2 series); check with the publisher of the program or your dealer for compatibility.



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CIRCLE READER SERVICE 23

BUSINESS & PRODUCTIVITY										
Title Publisher Price	Brief description	Hardware/ Equipment required	CP	O	D	EH	GQ	EU	V	
PRO STAFF WORD PROCESSOR ShareData, Inc. (see above for address and phone) \$40 ©1986	Even a novice can get up to speed in a short time with this writing tool. Its impressive extra features—such as automatic footnoting, a full spelling checker, and lines and boxes to highlight text—make it attractive for the experienced, too. —ZORNBERG	IBM PC.* 2nd drive optional.	N	★	★	★	★	E	★	★
PROWRITE New Horizons Software 206 Wild Basin Road, #109 Austin, TX 78746 (512) 328-6650 \$125 ©1987	"Flexible and functional. Suitable for almost any application." That's how I'd describe this word processor that allows you to write in any of seven colors (with color printer) and formats text properly around graphics in one of seven fonts. —SUMMERS	Amiga. Kickstart 1.2. 2nd drive, color printer optional.	N	★	★	★	★	E	★	★
PUTTING THE ONE MINUTE MANAGER TO WORK Spinnaker Software One Kendall Square Cambridge, MA 02139 (617) 494-1200 \$100 ©1986	Here's the framework for bringing the managerial concepts of the <i>One Minute Manager</i> to life in actual group situations. Designed so that employees or team members and the manager can work together with the program to achieve desired goals.† —HUNT	128K IBM PC.* 2nd drive.	N	★	★	★	N/A	E	★	★
SILK Daybreak Technologies, Inc. 21311 Hawthorne Blvd. Torrance, CA 90503 (213) 316-7940 \$298 ©1986, 1987	Many features that automate spreadsheet design make <i>Silk</i> a big time-saver even for experts, while on-line help and thoughtful menu system make it a boon for beginners. Shares data with Lotus 1-2-3. Highly recommended.† —SUMMERS	512K IBM PC.* 2nd drive. CGA, EGA. 8087/80287 math co-processor optional.	N	★	★	★	★	E	★	★
EDUCATION & CREATIVITY										
Title Publisher Price	Brief description	Hardware/ Equipment required	CP	O	D	EH	GQ	EU	V	
A.I. Scholastic Software 730 Broadway New York, NY 10003 (212) 505-3000 \$50 ©1987	It seems like a variant of tic-tac-toe at first, but A.I. (subtitled <i>An Experience with Artificial Intelligence</i>) is a different kind of "board" game—it's about learning, not winning. Satisfying for children and adults.† —ELTGROTH	Reviewed on 128K Apple. Also for 128K IBM PC.* 2nd drive optional.	Y	★	★	★	★	A	★	★
BUSINESS WEEK'S BUSINESS ADVANTAGE Reality Technologies 3624 Market St. Philadelphia, PA 19104 (215) 387-6055 \$50 ©1987	Your chances for success in learning about corporate decision making are at their best in this serious simulation that's a lot of fun. Includes a tutorial for business tyros that explains such corporate jargon as <i>market share</i> and <i>competitive strategy</i> .† —COLE	Reviewed on 384K IBM PC.* Also for 512K Macintosh. 2nd drive.	N	★	★	★	★	E	★	★
CREATE A CALENDAR Epyx, Inc. 600 Galveston Drive Redwood City, CA 94063 (415) 366-0606 \$26 ©1987	Calendar formats abound here—annual, monthly, weekly, and daily. There's even one that's six feet long. All can include graphics (85 are supplied), and text can be chosen from nine typestyles. It's simple, quick, and useful. —ODISIO	Reviewed on C 64/128. Also for 64K Apple. 128K IBM PC.* Printer.	Y	★	★	★	★	E	★	★
PRACTICA MUSICA Periscope Press P.O. Box 6926 Santa Barbara, CA 93160 (805) 564-2518 \$125 ©1987	Because <i>Practica Musica</i> presents music theory and ear-training as a game, I'm one amateur musician who's no longer confused by key signatures, intervals, scales, and such. Works with digitized organ sounds and an on-screen keyboard. —DONAHUE	512K Macintosh. Headphones or external speaker recommended.	Y	★	★	★	★	A	★	★
TEDDY BEAR*RELS OF FUN DLM, Inc. One DLM Park Allen, TX 75002 (214) 248-6300 \$40 ©1987	Create "bear-ably" cute signs, posters, banners, coloring books, and more—all decorated, of course, with teddy bears. Charming graphic enhancements include props, costumes, and borders. Suitable for children ages 5–12. —ZORNBERG	Reviewed on 64K Apple. Also for C 64/128. Color monitor, printer recommended.	Y	★	★	★	★	E	★	★
RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; CP Copy protected, yes or no; † Longer review follows chart *Titles listed for the IBM PC will also run on most IBM PC compatibles (as well as the IBM PS/2 series); check with the publisher of the program or your dealer for compatibility.										

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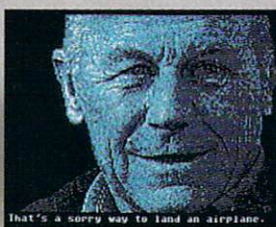
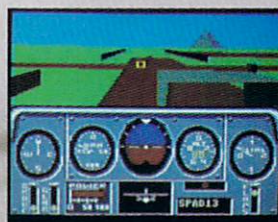
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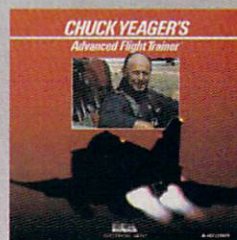
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EDUCATION & CREATIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	CP	O	D	EH	GQ	EU	V
UPTIME: VOL. 2, NO. 2 Viking Technologies, Inc. P.O. Box 299 Newport, RI 02840 (401) 847-2455 \$19 ©1986, 1987	The treats in this monthly disk collection range from a small word processor, an interpreter for writing programs in Logo, and an absorbing icon-based car-race game to desk accessories, a new font, and a graphics utility. Worth a look. —HALLERMAN	512K Macintosh. Separate versions for Apple, C 64/128, 128K IBM PC.*	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
YOUR PERSONAL POET Computer Poet Corp. 775 E. Greg St. Sparks, NV 89431 (702) 359-8200 \$30 ©1986	Writes poems to insert in greeting cards after you input the recipient's name and choose one or two personality traits from a list. Verses can be silly limericks or sentimentally sweet lines; sometimes they're strained. But it's good fun for some. —SUMMERS	Reviewed on IBM PC.* Also for 512K Macintosh. Printer.	N	★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★

ENTERTAINMENT

Title Publisher Price	Brief description	Hardware/ Equipment required	CP	O	D	PS	GQ	EU	V
BOP 'N RUMBLE Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$30 ©1987	Your task is to clear the streets of antisocial types in order to make the sidewalks safe for little old ladies. You attack your adversaries by kicking, punching, and grabbing their throats, among other maneuvers. Lacks a spark, and is simply another smash-'em-up. —DELSON	C 64/128. Joystick(s) recommended.	Y	★	★	★ ★	★ ★	A	★
CALIFORNIA GAMES Epyx, Inc. 600 Galveston Drive Redwood City, CA 94063 (415) 366-0606 \$40 ©1987	The latest installment in the sporting games series from Epyx is, like, totally wonderful. Among six hot events are skateboarding, surfing, roller-skating, dirt-bike racing, and flipping around a footbag. The music is also awesome. —LANGENDOEN	Reviewed on C 64/128. Also for Amiga, 64K Apple, Apple IIgs, 128K IBM PC.* Joystick.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
DELTA PATROL Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$20 ©1987	Meeting your doom can be fun in this outer space arcade game. You also get to improve your character's chances by acquiring new weapons and devices that enhance your ship's speed and power. Fast-paced action makes it a tough nut to crack. —DELSON	C 64/128. Joystick recommended.	Y	★ ★ ★	★	★ ★ ★	★ ★ ★	A	★ ★ ★
THE ETERNAL DAGGER Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1353 \$40 ©1987	Role-playing adventures reach striking new heights with this sequel to the highly popular <i>Wizard's Crown</i> . Your party of eight adventurers is comprised of such multifaceted personalities as ranger-priests. A trend-setting game.† —LANGENDOEN	Reviewed on Apple. Also for Atari, C 64/128. Color monitor recommended.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
THE LURKING HORROR Infocom 125 CambridgePark Drive Cambridge, MA 02140 (617) 492-6000 \$35-\$40 ©1987	H.P. Lovecraft meets the silicon age as the entire computer system at your university literally takes on a life of its own. It even transforms your term paper into meaningless garbage! The text adventure as modern-day horror story is well made. —LANGENDOEN	Reviewed on Apple. Also for C 64/128, IBM PC.* 512K Macintosh.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★
PIRATES! MicroProse Software 120 Lakefront Drive Hunt Valley, MD 21030 (301) 771-1151 \$40 ©1987	It's one of six periods from 1560 to 1700, and whether you call yourself merchant trader, pirate, buccaneer, or pirate hunter, your goal is to retire in wealth and comfort. This hybrid adventure is colorful, exciting, and complex entertainment.† —DELSON	Reviewed on C 64/128. Also for 128K Apple, IBM PC.* Joystick.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
WRATH OF DENETHENOR Sierra On-Line, Inc. Sierra On-Line Building Coarsegold, CA 93614 (209) 683-4468 \$25 ©1986	If <i>Ultima</i> is your kind of adventure, then <i>Wrath of Denethenor</i> is just your cup of mead. Played on a scrolling map board, this game lets you develop one character by successfully dealing with a slew of dangers. Most suitable for gamers with some experience. —DELSON	Reviewed on 128K Apple. Also for C 64/128.	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★

RATINGS KEY

O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; CP Copy protected, yes or no; † Longer review follows chart

*Titles listed for the IBM PC will also run on most IBM PC compatibles (as well as the IBM PS/2 series); check with the publisher of the program or your dealer for compatibility.

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Stickybear Reading uses animation to turn sentences into whimsical action on-screen while focusing on reading and vocabulary skills for 5 to 8-year-olds. *Best of the Best—Electronic Learning, Parents' Choice Award, NEA Certified (Apple, IBM, Commodore).*

Stickybear Math is a best-seller that makes learning to add and subtract great fun for 6 to 9-year-olds. "Destined to be a classic..." — *Electronic Learning, NEA Certified, Software Showcase and Parents' Choice Award (Apple, IBM, Commodore).*

Stickybear Math 2 sharpens multiplication and division skills for children ages 7 and up. "Excellent insight into the needs of the classroom teacher." — *Teaching and Computers, Rated A++—Educational Software Report (Apple, IBM, Commodore).*

These and other Weekly Reader Family Software programs are available for use on IBM-PC/XT/AT and compatibles (EGA, CGA or equivalent required). Look for the complete line of Weekly Reader Family Software programs for pre-school through junior high children in finer computer stores everywhere. Or call toll free 800 327-1473 (in Connecticut, call (203) 542-5553).

CIRCLE READER SERVICE 44



SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 60 for information such as copy protection and addresses of software publishers.

BUSINESS & PRODUCTIVITY

geoWrite Workshop

HARDWARE REQUIREMENTS: C 64/128.
PUBLISHER: Berkeley Softworks
PRICE: \$50

Here's good news for fans of GEOS, the "Graphic Environment Operating System" that turns the light-blue screen of a Commodore 64 or 128 into a Macintosh-like desktop. If you long for a more complete writing tool than *geoWrite*—one of the programs that comes with GEOS—you'll be glad to know about the *geoWrite Workshop*, a greatly enhanced word processor that's sold separately and runs within the GEOS environment. Because *geoWrite Workshop* is graphics oriented, you can create documents using a large variety of fonts and include graphics that have been created with *geoPaint*.

When you create a new document, the program allows up to 16 characters for file names. Across the top of the screen, you'll find boxes with commands including file, edit, options, page, font, and style. The next line down is a ruler, and below that are options for justification and line spacing. The large white space underneath represents a sheet of paper. When you are using a C 128, you see all of the page. With the C 64, you see two-thirds of the page as a writing window as it automatically flips back and forth to show the portion of the page on which you are working.

Finally, when you're ready to print, you can choose among four qualities of printing, including draft mode, high-quality mode (as it appears on the screen), and, if your printer supports it, near-letter-quality mode. I know, those are only three different qualities. Well, I was saving the highest quality for last. If you have an Apple LaserWriter, you also can print your document at 300 dots per inch. And if you don't have a LaserWriter, but do have a modem, you can upload your document to Berkeley Softworks via Quantum-Link, and, for a reasonable fee, the

company will print it for you.

The *geoWrite Workshop* includes several other features that round out the package. An extensive mail-merge program will even allow conditional merges. Your document can be set up so that if a condition is met, a certain piece of text is inserted and if not, a different piece of text is inserted. Using this feature you can, for instance, send personalized payment letters to all the members of your club. If they have paid their dues, you thank them, and if they haven't, you remind them that their bills are past due.

The documentation is complete and includes many examples to demonstrate how to get the most from the program. The one thing it lacks is a spelling checker, but even without it, the *geoWrite Workshop* is an impressive program. —BROOKS HUNT

Putting the One Minute Manager To Work

HARDWARE REQUIREMENTS: 128K IBM PC.
PUBLISHER: Spinnaker Software
PRICE: \$100

I read the *One Minute Manager* several years ago and remember thinking that I liked the concept. My boss must have liked it, too, because he was the one who suggested I read it. Unfortunately, we never implemented the system because we became busy with other things and forgot. I wish we had had this program—a framework on which to hang our *One Minute Manager* suits.

I was skeptical at first. How could a computer program help put the concepts taught by the *One Minute Manager* to work? Any word processor, or even a piece of paper, could do the same thing, couldn't it? Well, I was wrong. In case you've forgotten or never knew, the *One Minute Manager* is based on the P-R-I-C-E system. That stands for *pinpoint* an area for improvement, *record* past and present performance, *involve* your team members, *coach* them on their actions, and *evaluate* your unit's progress in improving the area identified. The program neatly covers each concept.

Some of these concepts can be confusing at first, but three types of help are always available. The first explains the concepts of the *One Minute Manager*. For example, it asks you to consider if the function is central to your unit and if it is part of the 20 percent of the work

that has an 80-percent impact on job performance. The second type provides a verbal description of what the active function keys do, and the third type offers a graphic that shows your current location and the various screens or sections to which you can move.

The program is designed to have the employees or team members and the manager work together. The data for each employee is protected by a password, so only he or she and the manager can access it. This means that a single data disk can hold the files of all team members and can be updated by the individual employee without fear of compromising another's privacy.

The documentation is brief, only 22 pages, but thorough. Not only does it describe the program, it explains how to implement it. For example, in the Record section, it advises you to appoint a statistician. In the Involve section, it counsels you to discuss each Pinpoint with the appropriate team member and then to listen. It explains that the team must be committed in order for the system to work.

The program is an excellent tool for implementing the *One Minute Manager* philosophy. If, after reading the book, you decide to adopt the P-R-I-C-E system of management, I recommend that you also adopt this program. Even if you haven't read the book, this program gives you a solid framework for putting the philosophy to work.

—BROOKS HUNT

Silk

HARDWARE REQUIREMENTS: 512K IBM PC.
PUBLISHER: Daybreak Technologies, Inc.
PRICE: \$298

Spreadsheet software is supposed to expedite financial analysis while increasing its accuracy. In reality, the software can succeed on all counts only if it provides both adequate functionality and a simple command structure—two characteristics that might appear to be mutually exclusive. Not so. In *Silk*, the advanced spreadsheet functions and large worksheet size are accompanied by a command structure that's easy to learn and convenient to use. Good documentation supplements an on-screen tutorial that demonstrates everything from the most basic spreadsheet moves to such advanced

SOFTWARE REVIEWS

features as data allocation and automatic time-series generation. Interactive Help screens follow your every move and can be turned off when they are no longer needed.

Silk worksheets can exceed 500,000 cells and also can access expanded memory (if you have it) to increase worksheet size. An individual cell can hold up to 4,000 characters of information, making it easy to document a worksheet or store textual data. An adequate range of mathematical, logical, and statistical functions streamline the creation of formulas, while macro commands help to automate frequently used procedures. You can sort and select worksheet entries in database fashion or output numbers into several graphic formats ranging from line graphs to pie charts.

Unlike some spreadsheets, *Silk* can even perform word processor-like search and replace, but this is only the beginning. *Silk* offers advanced features that automate some of the most tedious spreadsheet chores. For instance, if you'll be comparing data over a period of months or years, you need to define

date formats (such as 1/88 or Jan 88) only once. *Silk* will automatically generate the entire time series, complete with summary periods, such as quarters. *Silk* can also automatically allocate any numeric amount according to percentages you specify, fill a range with dates or numbers, and show you what figures you need to achieve a goal.

Perhaps *Silk*'s most unusual feature is its keystroke log. Available only on a computer equipped with a hard disk, this feature stores in a disk file every keystroke you enter while working on your spreadsheet. If a power failure interrupts your work or you forget to save your file, all is not lost—you can simply restore your spreadsheet, stroke by stroke.

Silk won't let you create the gargantuan spreadsheets that some other programs can and has fewer special commands than some, but it's more than adequate for all but the most complex worksheets. Its many automated spreadsheet-design features will make it a big time-saver even for the experienced spreadsheet user, while the on-screen help and

thoughtful menu system make it a boon for the beginner. Compatibility with other products is very good, since *Silk* can share data with 1-2-3 or programs that write DIF files (macro commands and other special formats won't translate, of course). I highly recommend this product.

—TAN A. SUMMERS

EDUCATION & CREATIVITY

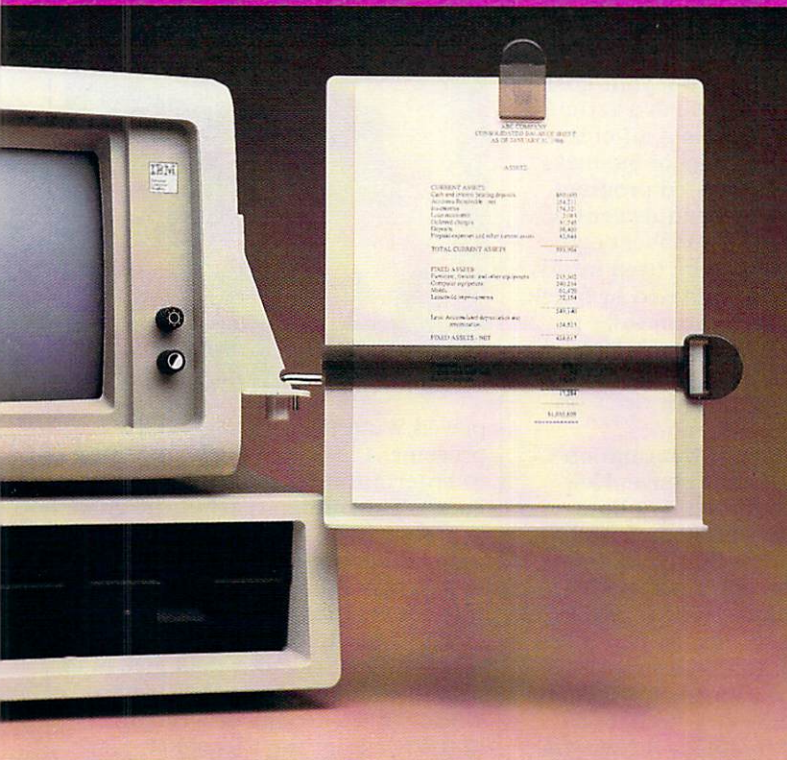
A.I.: An Experience with Artificial Intelligence

HARDWARE REQUIREMENTS: 128K Apple, 128K IBM PC.

PUBLISHER: Scholastic Software

PRICE: \$50

Imagine playing a game of tic-tac-toe with a computer. You'd expect to tie or lose, right? So I wasn't surprised when I lost every game I played the first time I sat down with A.I. But how fair was this? I didn't even know what patterns we were trying to make, and the computer did. Sometimes the goal was a circle or a square; other times a large X or a combination of the computer's pieces and my own. And just as I was about to get the hang of a pat-



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SOFTWARE REVIEWS

tern, the computer would chortle, "Sorry, I win again."

A.I. is a different kind of "board" game, and in order to prevent frustration among younger players, it is important for them to recognize that A.I. is about learning, not about winning. The goal of playing a game with A.I. is not so much to beat the computer brain, but to learn how it figures out the rules and beats you so well.

By working carefully through the 10 "Explorations" provided by the author, players catch on to the notions of teaching the computer "brain" new games and even programming it to play games that it cannot learn (games containing certain combinations of patterns or goals, such as games whose goals contain empty squares, or those in which the order of moves is important, or games



with more than four goals). "Brains" can be saved and may continue to learn more about the game in later sessions or have their learning mode turned off.

By utilizing various options, players can identify the strategy-making mechanisms A.I. uses to learn games and eventually modify them or provide their own. Experienced players can design games to stump their friends and set them against A.I. at various levels.

The reward in this software package, clearly, comes from learning how artificial intelligence works. I recommend it for those who like to think.

—MARLENE BUMGARNER ELTGROTH

Business Week's Business Advantage

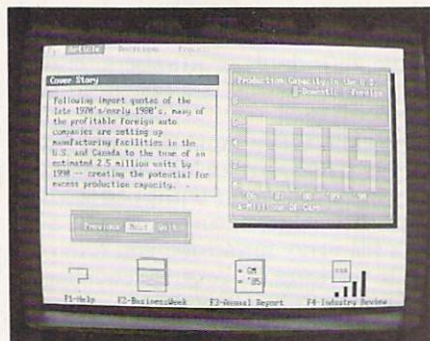
HARDWARE REQUIREMENTS: 384K IBM PC, 512K Macintosh.

PUBLISHER: Reality Technologies

PRICE: \$50

Ever wondered what it's like to be Lee Iacocca? Although *Business Week's Business Advantage* doesn't

come with a chauffeured limousine or a corporate jet, this simulation lets you call the shots at a giant United States company such as Chrysler without leaving your desk. The first step is to read an overview article



about your company in which a particular goal for the coming year is established, such as boosting your firm's return on sales. Then it's up to you to decide how much additional information you need to devise your strategy to meet that goal. You can access an annual report containing sales and inventory data, income statements, balance sheets, and five-year performance reports. Or you can enlist the help of outside consultants to help you focus on a particular marketing, finance, or operational issue. You can also call up relevant news accounts about the economy or other business conditions. After you have made your decisions, you are told bluntly how close or far you are from your goal.

Business Advantage is a serious simulation that is also a lot of fun, regardless of your level of business savvy. The sophisticated program, which comprises the equivalent of 400 interrelated spreadsheet equations, is designed to be used by anyone. If you are intimidated by fancy business jargon, you can call up a tutorial that explains such terms as *market share* and *accumulated depreciation* to aid in your decision making.

The abundance of information available is very impressive. However, if you are the kind of boss who prefers to make decisions based more on intuition than data from bar graphs and spreadsheets, then much of the material at your disposal may seem extraneous. But if you are interested, the program can teach you a lot about how big business works. Indeed, whether you choose to use *Business Advantage* merely as a game or as a sophisticat-

ed educational tool, that versatility is precisely what makes it an appealing program. In addition, you never need fear growing bored with your new-found power. At the end of the simulation, you are invited to buy a 12-month subscription of new *Business Advantage* simulations for \$250 (plus \$20 shipping, making it cost little more than \$20 per month), ensuring you of a new corporate empire over which to reign every month. What a perk!

—WENDY COLE

ENTERTAINMENT

The Eternal Dagger

HARDWARE REQUIREMENTS: Apple, Atari, C 64/128.

PUBLISHER: Strategic Simulations, Inc.

PRICE: \$40

Games come and games go but *The Eternal Dagger*, one of the latest role-playing adventures, is here to stay. It's the sequel to *Wizard's Crown* and uses a similar, but modified, play system. The differences lie in the myriad enhancements and improvements that are found in *Eternal Dagger*. New weapons, monsters, and combat options are included, but what is most striking is the total overhaul of the dungeon sequences. All party members are moved around as one, and only during combat are they controlled individually (for those of you who never

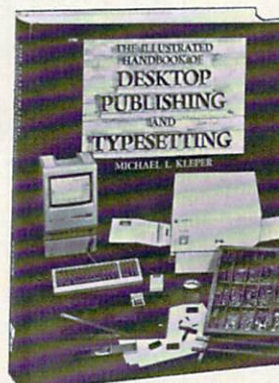
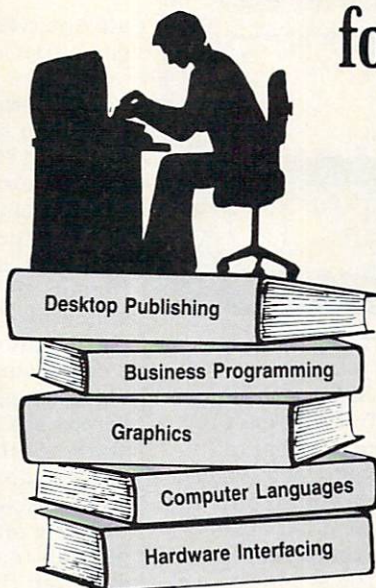


played *Wizard's Crown*, this improvement is one of the best things in entertainment software since *Pong*). The outdoor part of the game is greatly expanded; now there are many different lands through which to journey.

If not for these reasons, this game is worth playing on the basis of plot originality alone. Your final goal is to leap through a gate in the Demon World while carrying or wearing nothing except the *Eternal Dagger*. Although you must do the kill-an-

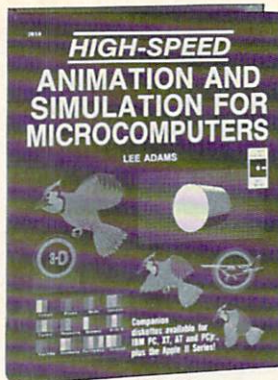
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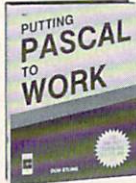
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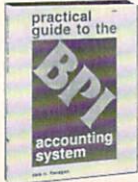
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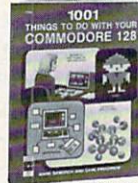
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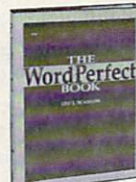
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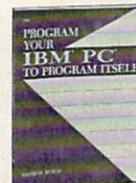
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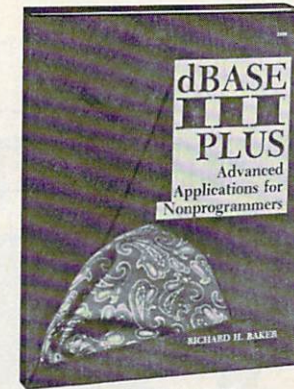
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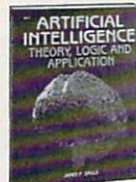
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SOFTWARE REVIEWS

evil-wizard-who-is-terrorizing-the-land-with-his-minions bit, it is, thankfully, only a sub-adventure. The logic behind the goal is that in a place called Middle World, a gate was opened to the realms of demonkind. The demons invaded, naturally, and are now destroying the land. Your party of adventurers, eight in all, is called upon to pass through a gate to Middle World and save it. This is not solely out of pity; your world is next on the demons' hit list.

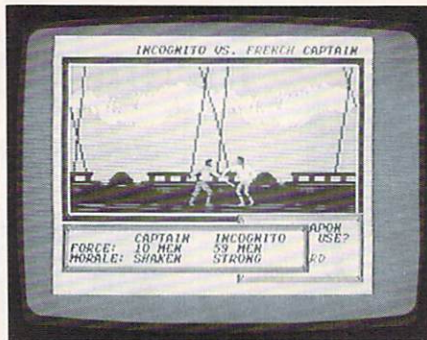
Although the game is initially frustrating because monsters attack you every step of the way, there are actually a finite number of beasts. As you start killing them off, you'll have fewer and fewer encounters, and you can even find and loot the monsters' lairs. Combat is resolved either in a detailed, tactical manner, or in a quick, computer-controlled battle.

The Eternal Dagger provides a refreshing originality that doesn't wear thin. It is a potential precedent setter and it and its influence may stay around for a long time to come.

—DAVID LANGENDOEN

Pirates!

HARDWARE REQUIREMENTS: 128K Apple, C 64/128.



PUBLISHER: MicroProse Software
PRICE: \$40

Ha-hargh, mates! Shiver me timbers and scupper me jib if this isn't the best computer game I've played in years! Ye plays the part of a buccaneer, me hearties, and ye roams the Spanish Main in search of adventure, wine, women, and plunder! Arr-ha-hargh! It's the sea life for ye!

Freely translated, that last paragraph lets you know that *Pirates!* is one of the most colorful and exciting games I've played in years. It's also the most beautifully interwoven hybrid of various game elements since *Starflight*. *Pirates!* combines the role-playing adventure with the military, political, financial, strategy, arcade, and simulation genres to cre-

ate one complex but highly playable game that will become a classic.

You take the part of a merchant trader, pirate, buccaneer, or pirate hunter in one of six periods from 1560 to 1700; or you can pretend to be a historical buccaneer such as Sir Francis Drake. While you pursue a career (peaceful, warlike, or both), your goal is to retire in wealth and comfort. Starting with one small ship and a minuscule crew, you plunge into sixteenth- and seventeenth-century commerce, carrying cargo for profit; or you take the dangerous sea lane to war and raid the ships of other countries.

There are battles at sea and on land, treasures to hunt, lost sisters to locate and free, booty to take, plunder to divide, honors to achieve, and even the occasional spell in prison if the cards don't fall your way.

The game is played with joystick controls, so it's fast-paced, and, with four play levels, it's always a challenge. This is one of the year's best, and is an absolute must for those who like complex adventure games. *Pirates!* will have a long-lasting influence on the gaming field.

—JAMES DELSON

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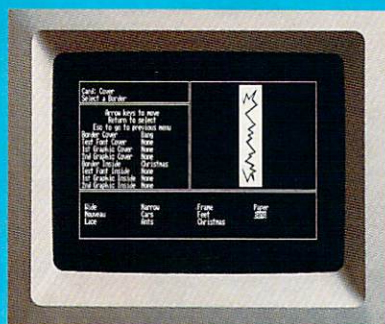
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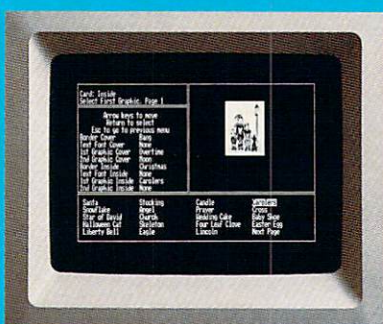


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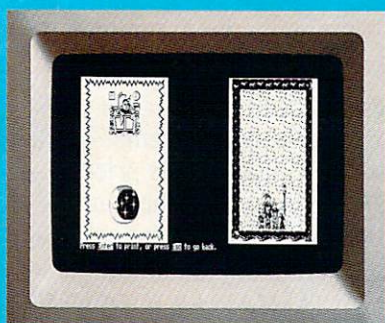
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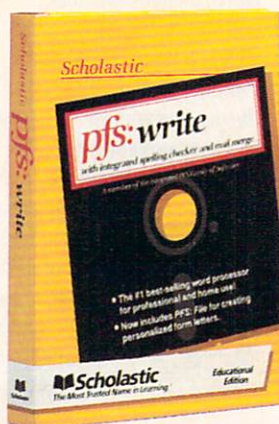
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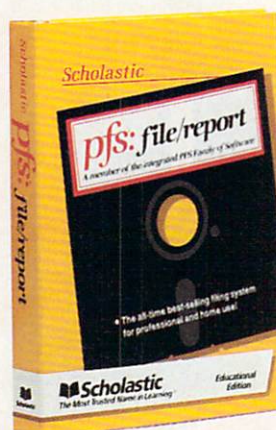
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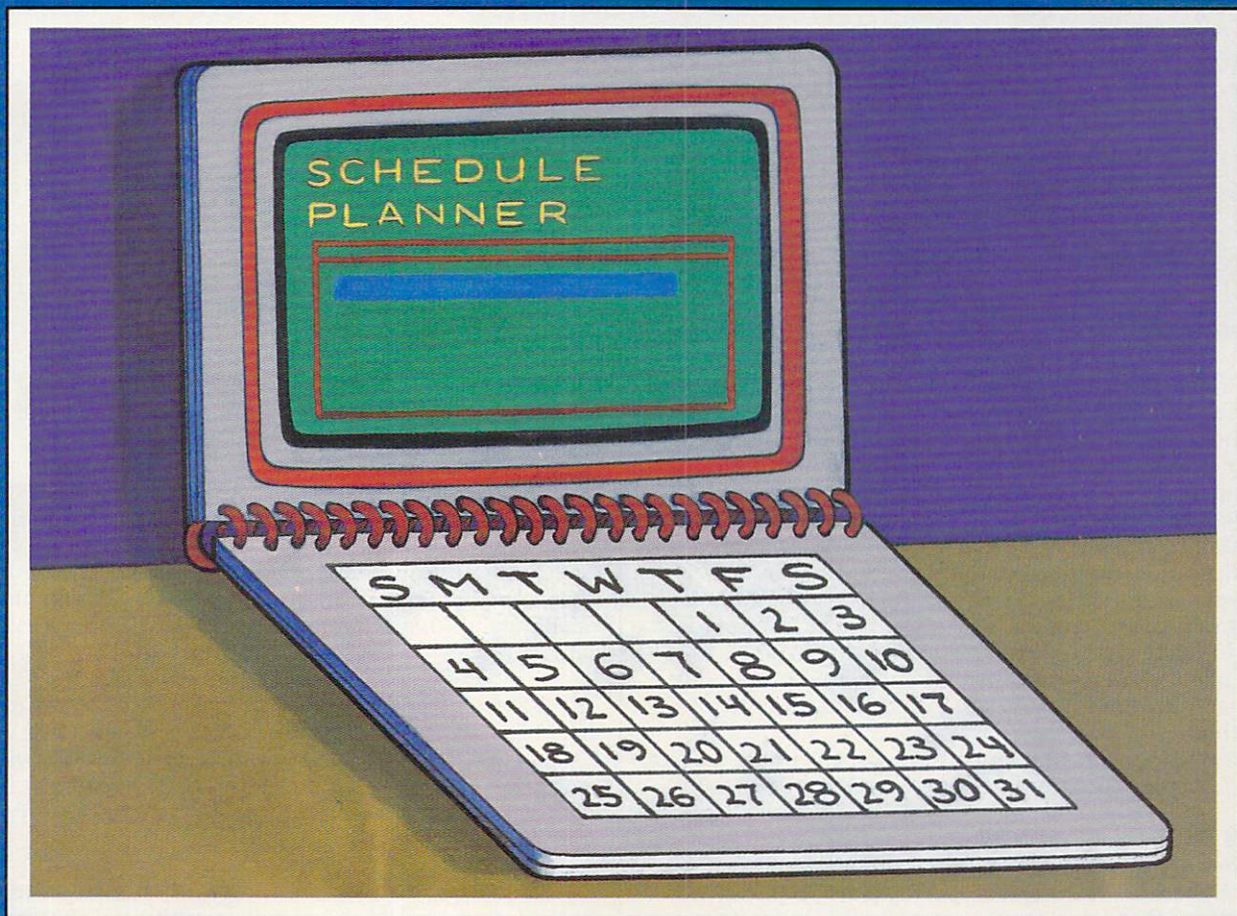
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THE PROGRAMMER



C O N T E N T S A N D C O V E R A G E

PRODUCTIVITY PROGRAM Page 74

Disorganized? *Schedule Planner* can help you keep track of daily appointments and special events throughout the year.

PUZZLE Page 86

The solution to last month's *Crossword Puzzler*.

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Your house will be a beehive of activity when you and your friends play *Buzz*, a simple and challenging math game.

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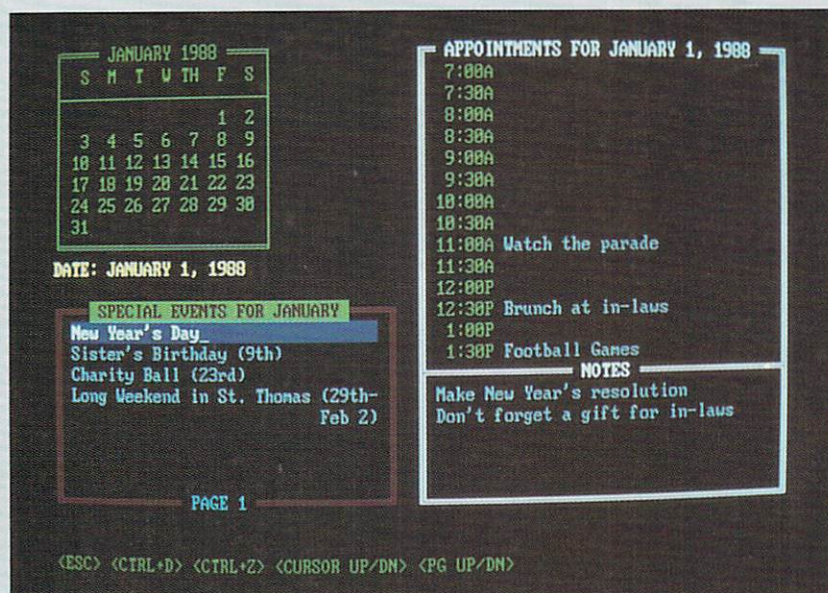
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KEY: * Program in this issue for this computer. D Disk drive required. P Printer optional.

SCHEDULE PLANNER

BY STEVEN C.M. CHEN



A screen display of *Schedule Planner* with special events for January and appointments and notes for January 1, 1988.

Keeping track of daily appointments and tasks, monthly meetings, and special yearly events, such as birthdays and holidays, can be a chore in itself. While a wall calendar is a good place to mark monthly activities, and an appointment book is great for detailing the activities you've planned for a day, neither one is ideal for both scheduling tasks. Our *Schedule Planner* program easily handles the breakdown of daily appointments, has a window for listing special events in a month, and also displays a calendar month by month. What's more, it's easy to make a printout—or a series of printouts, as your plans change—of your appointments for any day or of all the appointments and events for an entire month.

If you would just like a printout of a calendar, try our *Wall Calendar* program in the December 1987 issue.

HOW TO GET STARTED

Schedule Planner is composed of two programs: The first, *Schedule Planner Setup Program*, prepares the data disks that you'll need to use *Schedule Planner*. Every calendar year must have its own set of data disks, so when January 1989 comes around you'll need to run the setup program again.

The setup program generates three kinds of files: (1) a separate file for each month [SCHJAN88.APP, SCHFEB88.APP, . . . , SCHDEC88.APP] to hold your schedule and special events for that month; (2) a separate file for each data disk [DATADISK.1, DATADISK.2, and so forth] to help the program differentiate among the disks; and (3) one file [SCHEDULE.DAT] that contains the actual monthly calendars displayed in the upper left corner of the screen. In the IBM PC and compatibles version, the calendars for the previous and following years are also contained in this file.

The second listing, *Schedule Planner Main Program*, controls all of the day-to-day functions of the program.

To get *Schedule Planner* up and running, follow these five simple steps:

1. Type in and save the *Schedule Planner Setup Program* and *Schedule Planner Main Program*. It is best if

you do not add extra REM statements when typing in the program because they will take up valuable memory space. Make a backup, and label both disks.

2. Format two more disks if you are using the IBM PC version or three more disks if you are working on an Apple or Commodore 64 (special instructions for hard-disk users appear below). These disks will contain the appointments, notes, and special events data for the 12 calendar months and should be labeled 1988 DATA DISK #1, 1988 DATA DISK #2, and so forth.

3. Load and run the setup program. When you are asked to choose a year, enter a year between 1802 and 2398. The setup program will then write a series of files onto the data disks you just formatted. Be sure to follow the instructions carefully or you will have to repeat step 2.

4. Load and run the main program. January 1 (or the current date on IBM PC and compatibles) of the year chosen appears on screen.

5. You are now ready to move through the calendar year, inputting daily appointments, notes, and special monthly events. It's a good idea to thoroughly test the various functions of the program before you start.

HOW TO USE SCHEDULE PLANNER

The commands available at each level of *Schedule Planner* appear at the bottom of the screen for that level. Their functions are outlined in the Command Summary chart below. In general, you can display a calendar by month (or a three-year calendar on IBM), select a specific date, open an appointment window for that day to detail your activities, or make general notes for the day in a separate box. You can also open a window to list special events for the month, such as birthdays or holidays. Printouts of special monthly events or of the appointments and notes for a specific day are also available.

As you move through the different days and months

COMMAND SUMMARY

OPENING SCREEN

- CURSOR UP/DN** changes current day
- CURSOR LT/RT** moves among months in current year
- RETURN/ENTER** opens appointments/notes window and appointments entry mode
- ESC** returns to opening screen
- CTRL + E** opens special events window and special events entry mode
 - ESC** returns to appointments entry mode
 - CTRL + D** *deletes highlighted event
 - CTRL + Z** clears highlighted event
 - CURSOR UP/DN** moves up or down among events
 - CURSOR LT/RT** moves up or down among six special event pages (eight pages for IBM)
- CTRL + N** moves to notes entry mode
 - ESC** returns to opening screen
 - CTRL + A** returns to appointments entry mode
 - CTRL + D** *deletes highlighted note
 - CTRL + E** opens special events window and special events mode. Up to 60 entries can be made per month (64 entries for IBM)
 - CTRL + P** prints today's appointments and notes (press ESC to exit)
 - CTRL + Z** clears highlighted note
 - CURSOR UP/DN** move up or down among note lines (up to five lines of notes can be entered per day)
- CTRL + P** prints today's appointments and notes (press ESC to exit)
- CTRL + Z** clears highlighted appointment
- CURSOR UP/DN** moves among time slots in appointment schedule. Scrolls through pages, days, and months in a calendar year. (A total of 14 time slots per day from 7:00A to 8:00P or 28 half-hour time slots from 7:00A to 8:30P for IBM.)
- CURSOR LT/RT** moves among pages, days, and months
- C** displays a three-year calendar with six months per page (IBM only)
- CURSOR LT/RT** moves to previous or next page of the calendar
- ESC** returns to main screen
- P** prints this month's appointments and notes or the special events
- Q** quits *Schedule Planner*

* Backspace/Delete deletes previous character

of a calendar year, the program will save your appointments, notes, and special events to disk when you change from one month to the next. Since not all months are on the same disk, you will be asked to insert specific data disks as needed. Hard-disk users need only press the SPACE BAR when asked to change disks.

Frequently the Apple and IBM PC versions will pause for about 30 seconds to reallocate memory space. The message "BASIC IS DOING HOUSECLEANING: PLEASE STAND BY" will appear on the screen until this reorganization is complete. When you are ready to exit the program, be sure to use the **Q**uit command or your latest entries will not be saved.

SPECIAL INSTRUCTIONS FOR YOUR VERSION

APPLE

Schedule Planner will not work with a memory-resident program (such as GPLE) that uses any of the following keys or key combinations: ESC, CTRL + A, CTRL + D, CTRL + E, CTRL + N, CTRL + P, CTRL + Z, CTRL + J, or CTRL + K.*

Apple II and II Plus owners, who do not have CURSOR UP/DN, should use CTRL + J for CURSOR UP and CTRL + K for CURSOR DN.

COMMODORE

On the Commodore, use the ← key (located at upper left of the keyboard) instead of ESC.

IBM PC & COMPATIBLES

The Calendar option generates a three-year calendar for the year you select, the year preceding it, and the year following it. Six months can be displayed on the screen at one time.

If you're working on an IBM PC or compatible and have set your internal clock, a calendar page for the current month in the year you chose will appear, with the day's date listed below. For example, if you select the year 2000 and run the program on February 10, 1988, a calendar page for February 10, 2000 will appear.

You can compile *Schedule Planner's* main program under QuickBASIC 3.0 for a quicker execution.

* Please note that the "+" (plus sign) is not part of the key combinations.

HARD-DISK USERS

If you have a hard disk, you can avoid disk swapping by installing the program on your hard drive. Then, when the program asks you to change disks, simply press the SPACE BAR. To put the program on your hard drive, create a subdirectory for the files in the program. (Be sure to change your default subdirectory before you run the setup and main program.) Data files require a separate subdirectory for every year. Also, each person using *Schedule Planner* should establish his or her own set of subdirectories.

You can put the main program and the setup program in the same directory as the data files, but if you intend to generate a data file for more than one year or if more than one person is going to use the program, you may wish to establish a separate subdirectory for the two programs.

Owners of a high-density 3.5-inch disk drive (720KB or more) only need one data disk for each year. When the program asks you to change data disks, simply press the SPACE BAR.

PRODUCTIVITY PROGRAM

Apple II series w/disk drive/Schedule Planner Setup Program

```

10 TEXT:NORMAL:DIM ML(12),WP(12),FTS(12),MOS(12)
20 DIM NMS(31),TMS(14):DS = CHR$(4)
30 GS = CHR$(7):QS = CHR$(34):SPS = CHR$(32)
40 DAS = "-":FOR L = 2 TO 37:DAS = DAS+"-":NEXT L
50 UL$ = CHR$(95):FOR L = 2 TO 28:UL$ = UL$+CHR$(95)
60 NEXT L:FOR L = 1 TO 12:READ MOS(L),ML(L):NEXT L
70 FOR L = 1 TO 31:TS = "":IF L < 10 THEN TS = SPS
80 NMS(L) = QS+TS+STR$(L)+SPS+QS:NEXT L
90 C = 7:FOR L = 1 TO 14
100 Z$ = STR$(C):IF C < 10 THEN Z$ = SPS+Z$
110 TMS(L) = QS+Z$+"00":C = C+1:IF C > 12 THEN C = 1
120 NEXT L:TS = "A"+SPS:FOR L = 1 TO 14
130 TMS(L) = TMS(L)+TS+QS:IF L = 5 THEN TS = "P"+SPS
140 NEXT L
150 HOME:INPUT "WHAT YEAR IS THIS SCHEDULE FOR? ";Y
160 IF Y < 1802 OR Y > 2398 THEN PRINT GS:GOTO 150
170 HOME:ML(2) = 28+(Y/4 = INT(Y/4) AND Y/100 <> INT(Y/100)) OR Y = 2000
180 FOR M = 1 TO 12:SY = Y:SM = M
190 IF SM < 3 THEN SM = SM+12:SY = SY-1
200 T = INT((SY*1.25)+(SY < 1900)+(SY > 2000)*INT((SY-2000)/100))+INT((SM-2)*2.59)
210 WP(M) = T+1-INT(T/7)*7
220 FTS(M) = LEFT$(MOS(M),3)+MID$(STR$(Y),3)+"SCH.APP"
230 NEXT M:HOME:ONERR GOTO 470
240 L = 1:GOSUB 1000:FS = "SCHEDULE.DAT"
250 VTAB 12:HTAB 10:PRINT "CREATING ";FS
260 PRINT DS;"OPEN";FS:PRINT DS;"WRITE ";FS
270 FOR L = 1 TO 31:PRINT NMS(L):NEXT L
280 FOR L = 1 TO 12:PRINT FTS(L):PRINT MOS(L)
290 PRINT ML(L):PRINT WP(L):NEXT L
300 FOR L = 1 TO 14:PRINT TMS(L):NEXT L
310 PRINT DS:PRINT UL$:PRINT CHR$(124)
320 PRINT "<CURSOR UP/DN> <CURSOR LT/RT> <RETURN>"
330 PRINT "<P>PRINT <Q>QUIT"
340 PRINT "<ESC> <CTRL+E> <CTRL+N> <CTRL+P>"
350 PRINT "<CTRL+Z> <CURSOR UP/DN> <CURSOR LT/RT>"
360 PRINT "<ESC> <CTRL+D> <CTRL+Z> <CURSOR UP/DN>"
370 PRINT "<CURSOR LT/RT>"
380 PRINT "<ESC> <CTRL+A> <CTRL+D> <CTRL+E>"
390 PRINT "<CTRL+P> <CTRL+Z> <CURSOR UP/DN>"
400 PRINT Y:PRINT DS;"CLOSE ";FS
410 FOR L = 1 TO 3:HOME:IF L > 1 THEN GOSUB 1000
420 FOR M = L*4-3 TO L*4:FS = FTS(M)
430 VTAB 12:HTAB 10:PRINT "CREATING ";FS:PRINT
440 PRINT DS;"OPEN ";FS:PRINT DS;"WRITE ";FS
450 FOR N = 1 TO ML(M)*19+60:PRINT:NEXT N
460 PRINT DS;"CLOSE ";FS:NEXT M,L:POKE 216,0:HOME:END
470 PRINT DS;"CLOSE ";FS
480 PRINT "ERROR ";PEEK(222);" HAS OCCURRED IN LINE ";
PEEK(218)+PEEK(219)*256;".
490 PRINT GS;GS:POKE 216,0:END
1000 PRINT GS;GS:"INSERT DATA DISK #";L
1010 PRINT "IN CURRENT DISK DRIVE."
1020 PRINT:PRINT "PRESS <SPACE BAR> TO CONTINUE.";
1030 GET KS:IF KS <> SPS THEN 1030
1040 HOME:PRINT:FS = "DATADISK."+STR$(L)
1050 PRINT DS;"OPEN ";FS:PRINT DS;"CLOSE ";FS:RETURN
2000 DATA JANUARY,31,FEBRUARY,28,MARCH,31,APRIL,30
2010 DATA MAY,31,JUNE,30,JULY,31,AUGUST,31,SEPTEMBER
2020 DATA 30,OCTOBER,31,NOVEMBER,30,DECEMBER,31

```

Apple II series w/disk drive (printer optional)/Schedule Planner Main Program

```

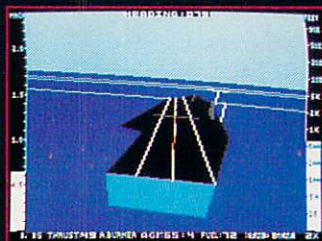
10 DIM ML(12),WP(12),AS(589),CMS(4),EVS(60),FTS(12)
20 DIM MOS(12),MSG$(8),NMS(31),TMS(14):CES = CHR$(5)
30 CPS = CHR$(16):DS = CHR$(4):ES = CHR$(27)
40 GS = CHR$(7):QS = CHR$(34):SPS = CHR$(32)
50 CL$ = SPS:FOR L = 2 TO 39:CL$ = CL$+SPS:NEXT L
60 DK$ = CHR$(11)+CHR$(10)+CHR$(8)+CHR$(21)
70 PRINT DS;"CLOSE":CMS(1) = "PQ"+CHR$(13)+DK$
80 CMS(2) = DK$+ES+CPS+CES+CHR$(14):CMS(3) = DK$+ES+DS
90 CMS(4) = LEFT$(DK$,2)+CHR$(1)+ES+DS+CPS+CES

```

```

100 HOME:PRINT TAB(10);"SCHEDULE PLANNER"
110 M = 1:GOSUB 1000:POKE 216,0:ONERR GOTO 220
120 FS = "SCHEDULE.DAT"
130 VTAB 3:HTAB 8:PRINT "LOADING ";FS;".":PRINT
140 PRINT DS;"LOCK";FS:PRINT DS;"UNLOCK";FS
150 PRINT DS;"OPEN";FS:PRINT DS;"READ";FS
160 FOR L = 1 TO 31:INPUT NMS(L):NEXT L
170 FOR L = 1 TO 12:INPUT FTS(L),MOS(L),ML(L),WP(L)
180 NEXT L:FOR L = 1 TO 14:INPUT TMS(L):NEXT L
190 INPUT DAS,UL$,VS:FOR L = 1 TO 8:INPUT TS
200 MSG$(L) = TS+LEFT$(CLS,39-LEN(TS)):NEXT L:INPUT CY
210 PRINT DS;"CLOSE";FS:POKE 216,0:GOTO 230
220 GOSUB 1100:RESUME
230 HOME:M = 1:CD = 1:WF = 0:GOSUB 1300
240 HOME:MP = 1:GOSUB 1500:GOSUB 3000
250 GOSUB 1600:GOSUB 1700:IF CK = 0 THEN 250
260 IF CK < 3 THEN HOME
270 ON CK GOTO 290,450,470
280 CK = CK-3:GOSUB 1800:GOTO 250
290 LS = 1:GOSUB 4010:POKE 216,0:HOME
300 PRINT "PRINT THIS MONTH'S <A>PPOINTMENTS/NOTES"
310 PRINT "OR THE <S>PECIAL EVENTS?"
320 GOSUB 1600:IF KS = ES THEN 240
330 IF KS <> "A" AND KS <> "S" THEN PRINT GS:GOTO 320
340 HOME:CS = KS:GOSUB 1900:IF KS = ES THEN 240
350 PRINT:PRINT DS;"PR#1":IF CS = "S" THEN 400
360 FOR D = 1 TO ML(M):GOSUB 2000
370 IF D/2 = INT(D/2) THEN FOR W = 1 TO 6:PRINT:NEXT W
380 NEXT D:IF ML(M)/2 = INT(ML(M)/2) THEN 440
390 FOR L = 1 TO 36:PRINT:NEXT L:GOTO 440
400 PRINT "SPECIAL EVENTS FOR ";MOS(M);";";SPS;CY
410 C = 1:FOR W = 1 TO 60:TS = EV$(W)
420 IF TS <> "" THEN PRINT TS:C = C+1
430 NEXT W:FOR W = 1 TO 66-C:PRINT:NEXT W
440 PRINT DS;"PR#0":GOTO 240
450 PRINT "ARE SURE YOU WANT TO QUIT?":GOSUB 1600
460 ON KS <> "Y" GOTO 240:HOME:END
470 WF = 1:LS = 1:GOSUB 4000:POKE 216,0
480 TM = 1:LM = 1:WW = 37:WH = 20:GOSUB 2100
490 GOSUB 3140:AP = 1:NP = 1:A = 1:B = 14
500 VTAB 16:HTAB 2:PRINT DAS:VTAB 16:HTAB 16
510 PRINT "NOTES ":GOSUB 2200:GOSUB 2300
520 FG = 1:MP = 2:GOSUB 1500:WX = 10:WY = AP+1:FL = 28
530 V = 19*CD-19+AP:TS = AS(V):GOSUB 5000
540 AS(V) = TS:GOSUB 1700:IF CK = 0 THEN 530
550 ON CK GOTO 560,560,580,580,610,620,660,890
560 DY = (CK - 2) - (CK = 1):AP = AP+DY:WY = WY+DY
570 IF AP > 0 AND AP < 15 THEN 530
580 CK = CK - (CK > 2)*2:GOSUB 1800:GOSUB 1500
590 AP = 1:A = 1:B = 14:GOSUB 2200
600 WY = 2:GOSUB 2300:GOTO 530
610 LS = 2:GOSUB 4000:POKE 216,0:WF = 0:GOTO 240
620 GOSUB 1400:GOSUB 1900:IF KS = ES THEN 650
630 POKE 34,23:PRINT:PRINT DS;"PR#1":D = CD
640 GOSUB 2000:HOME:PRINT DS;"PR#0":POKE 34,0
650 MP = 4-FG*2:GOSUB 1500:ON FG GOTO 530:GOTO 910
660 TM = 3+FG*7:LM = 2:WW = 35:WH = 10
670 FL = 33:GOSUB 2100:WX = 4:WY = TM+1
680 TS = " SPECIAL EVENTS FOR "+MOS(M)+SPS
690 VTAB TM:HTAB 2+INT((39-LEN(TS))/2):INVERSE
700 PRINT TS:NORMAL:MP = 3:GOSUB 1500:P = 0:EP = 1
710 C = 1:FOR W = P*10+1 TO P*10+10:TS = EV$(W)
720 VTAB TM+C:HTAB 4:PRINT TS:LEFT$(CLS,34-LEN(TS))
730 C = C+1:NEXT W
740 VTAB TM+11:HTAB 16:PRINT " PAGE ";P+1:SPS
750 V = P*10+EP:TS = EV$(V):GOSUB 5000
760 EV$(V) = TS:GOSUB 1700:IF CK = 0 THEN 750
770 ON CK GOTO 780,780,810,810,840,860
780 DY = (CK - 2) - (CK = 1):EP = EP+DY
790 IF EP > 0 AND EP < 11 THEN WY = WY+DY:GOTO 750
800 CK = 3+(EP = 11)
810 P = P+(CK = 4) - (CK = 3)
820 P = P+((P = -1) - (P = 6))*6
830 WY = TM+1:EP = 1:GOTO 710
840 TM = 1:LM = 2:IF FG THEN A = 9:B = 14:GOTO 500
850 A = 2:B = 13:GOSUB 2200:GOTO 900

```

1985 - High-performance Jet flight simulator for the IBM, Commodore 64, and Apple II computers



1987 - Expanding Scenery disk coverage; East Coast, Japan, & Europe



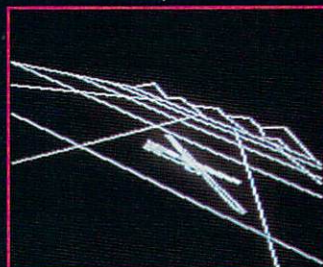
1979 - 3D graphics applied to the original FS1 Flight Simulator for the new Apple II and TRS-80 computers



1982/1983 - Microsoft Flight Simulator & Flight Simulator II



1986 - Flight Simulator II for the 68000 computers



1977 - SubLOGIC's 3D graphics package in BASIC and M6800 Assembly Language

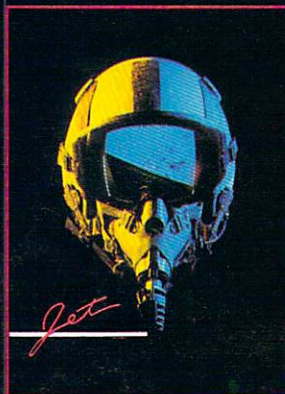
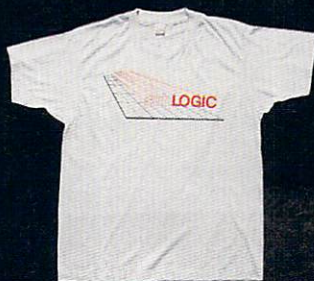
Ten Years of Technology and Dedication

Some say our technology has helped us define the state of the art in flight simulation. We believe our ten years of dedication have gotten us where we are today.

SubLOGIC's first black & white 3D graphics routines, developed in 1977, paved the way for our introduction to flight simulation and aerial combat gaming theory. Our second-generation Flight Simulator II was so well conceived that even we find it difficult to improve upon. Jet's spectacular land and sea battle scenarios set another classic milestone in state-of-the-art simulation gaming. Scenery concepts incorporated into SubLOGIC flight simulation products right from the start continue to evolve as we introduce new, more beautifully detailed areas of the world to explore. And coming in 1988 - a flight control yoke for even more realism!

We invite you to help us celebrate our first decade of success, and share in our anticipation of the next ten years to come. SubLOGIC tenth-anniversary promotional shirts and posters are available at your dealer or directly from SubLOGIC. See your dealer, or write or call us for more information.

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Champaign IL 61820
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(except in Illinois)



PRODUCTIVITY PROGRAM

```

860 IF V = 60 THEN 880
870 FOR W = V TO 59:EV$(W) = EV$(W+1):NEXT W
880 EV$(60) = "":GOTO 710
890 FG = 0
900 MP = 4:GOSUB 1500:WX = 3:WY = 16+NP:FL = 35
910 V = 19*CD-5+NP:TS = AS(V):GOSUB 5000
920 AS(V) = TS:GOSUB 1700:IF CK = 0 THEN 910
930 ON CK GOTO 940,940,520,610,970,620,660
940 NP = NP+(CK = 2)-(CK = 1)
950 NP = NP+(CK = 0)-(CK = 6))*5
960 WY = 16+NP:GOTO 910
970 T = 19*CD:IF V = T THEN 990
980 FOR W = V TO T-1:AS(W) = AS(W+1):NEXT W
990 AS(T) = "":GOSUB 2300:GOTO 910
1000 FS = "DATADISK."+STR$(INT((M+3)/4))
1010 POKE 34,23:ONERR GOTO 1040
1020 PRINT:PRINT DS;"LOCK";FS
1030 PRINT DS;"UNLOCK";FS:PRINT:POKE 34,0:RETURN
1040 VTAB 23:HTAB 1:PRINT GS;"INSERT DATA DISK # ";INT
((M+3)/4);" IN CURRENT DRIVE."
1050 GOSUB 1200:GOSUB 1400:PRINT:RESUME
1100 VTAB 23:HTAB 1:PRINT GS;"ERROR ";PEEK(222);" HAS
OCCURRED IN LINE ";PEEK(218)+PEEK(219)*256;".
1110 GOSUB 1200:GOSUB 1400:RETURN
1200 PRINT "PRESS <SPACE BAR> TO CONTINUE.";
1210 GOSUB 1600:ON KS <> SP$ GOTO 1210:RETURN
1300 VTAB 23:HTAB 1
1310 PRINT "BASIC IS DOING HOUSECLEANING;"
1320 PRINT "PLEASE STAND BY.";FRE(0);
1330 GOSUB 1400:RETURN
1400 VTAB 23:HTAB 1:PRINT CL$:PRINT CL$;:RETURN
1500 VTAB 23:HTAB 1:PRINT MSG$(MP*2-1)
1510 PRINT MSG$(MP*2);:RETURN
1600 K = PEEK(-16384)-128:IF K < 0 THEN 1600
1610 POKE -16368,0
1620 KS = CHR$(K-(K > 96)*(K < 123)*32):RETURN
1700 CK = 0:FOR L = 1 TO LEN(CMS(MP))
1710 IF MID$(CMS(MP),L,1) = KS THEN CK = L:L = 10
1720 NEXT L:IF CK = 0 THEN PRINT GS;
1730 RETURN
1800 ON CK GOTO 1810,1840,1870,1870
1810 CD = CD-1:IF CD > 0 THEN GOSUB 3140:RETURN
1820 LS = 2:GOSUB 4000:M = M-1
1830 M = M+(M = 0)*12:CD = ML(M):GOTO 1890
1840 CD = CD+1:IF CD <= ML(M) THEN GOSUB 3140:RETURN
1850 LS = 2:GOSUB 4000:CD = 1
1860 M = M+1:M = M-(M = 13)*12:GOTO 1890
1870 M = M+(CK = 4)-(CK = 3):M = M+(M = 0)-(M = 13))*
12
1880 IF CD > ML(M) THEN CD = ML(M)
1890 LS = 1:GOSUB 4000:GOSUB 3000:RETURN
1900 VTAB 23:HTAB 1
1910 PRINT "PLEASE PRESS <SPACE BAR> WHEN"
1920 PRINT "PRINTER IS READY OR <ESC> TO EXIT.";
1930 GOSUB 1600:IF KS <> ES AND KS <> SP$ THEN PRINT G
$:GOTO 1930
1940 GOSUB 1400:RETURN
2000 PRINT MO$(M);SP$;D;" ";CY
2010 PRINT "DAILY APPOINTMENTS":PRINT:P = D*19-18
2020 FOR W = P TO P+13:TS = TMS(W-P+1)+AS(W)
2030 IF LEN(TS) = 7 THEN TS = TS+UL$:GOTO 2040
2040 PRINT TS:NEXT W:PRINT:PRINT
2050 PRINT "NOTES":PRINT
2060 FOR W = P+14 TO P+18:PRINT AS(W):NEXT W
2070 FOR W = 1 TO 4:PRINT:NEXT W:RETURN
2100 VTAB TM:HTAB LM:PRINT SP$;LEFT$(DA$,WW);SP$
2110 FOR W = 1 TO WH:VTAB TM+WH:HTAB LM
2120 PRINT VS;LEFT$(CL$,WW);VS:NEXT W
2130 VTAB TM+WH+1:HTAB LM
2140 PRINT SP$;LEFT$(DA$,WW);SP$:RETURN
2200 C = A+1:FOR W = A TO B
2210 TS = AS(19*CD-19+W):VTAB C:HTAB 2
2220 PRINT SP$;TMS(W);TS;LEFT$(CL$,29-LEN(TS))
2230 C = C+1:NEXT W:RETURN
2300 FOR W = 17 TO 21:TS = AS(19*CD+W-21)
2310 VTAB W:HTAB 2:PRINT SP$;TS;LEFT$(CL$,36-LEN(TS))

```

```

2320 NEXT W:RETURN
3000 IF WF THEN 3140
3010 TS = SP$+MO$(M)+SP$+STR$(CY)+SP$
3020 T = 11-INT(LEN(TS)/2):VTAB 1:HTAB 1
3030 PRINT SP$;LEFT$(DA$,T);TS;LEFT$(DA$,22-T-LEN(TS))
;SP$
3040 PRINT VS;" S M T W T H F S ";VS
3050 PRINT VS;LEFT$(DA$,22);VS
3060 P = WP(M)-1:C = 1:TS = VS+LEFT$(CL$,P*3+1)
3070 FOR D = 1 TO ML(M):IF P <> 7 THEN 3090
3080 P = 0:PRINT TS;VS:C = C+1:TS = VS+SP$
3090 P = P+1:TS = TS+NMS(D):NEXT D
3100 IF P < 7 THEN TS = TS+LEFT$(CL$,21-P*3)
3110 PRINT TS;VS
3120 PRINT SP$+LEFT$(DA$,22)+SP$
3130 IF C <> 6 THEN FOR S = C+1 TO 6:PRINT CL$:NEXT S
3140 TS = MO$(M)+SP$+STR$(CD)+", "+SP$+STR$(CY)+SP$
3150 IF WF THEN 3170
3160 VTAB 11:HTAB 1:PRINT "DATE: ";TS;SP$;SP$:RETURN
3170 TS = " APPOINTMENTS FOR "+TS:T = LEN(TS)
3180 Z = INT((37-T)/2):VTAB 1:HTAB 1
3190 PRINT LEFT$(SP$+DA$,Z+1);TS;RIGHT$(DA$+SP$,37-Z-T
+1):RETURN
4000 IF NOT WF THEN RETURN
4010 GOSUB 1400:GOSUB 1000
4020 FS = FT$(M):POKE 34,23:ONERR GOTO 4140
4030 PRINT:PRINT DS;"LOCK";FS:PRINT DS;"UNLOCK";FS
4040 POKE 34,0:IF LS = 2 THEN 4090
4050 VTAB 23:HTAB 1:PRINT "LOADING ";FS;".
4060 PRINT DS;"OPEN";FS:PRINT DS;"READ";FS
4070 FOR W = 1 TO 19*ML(M):INPUT AS(W):NEXT W
4080 FOR W = 1 TO 60:INPUT EV$(W):NEXT W:GOTO 4130
4090 VTAB 23:HTAB 1:PRINT "SAVING ";FS;".
4100 PRINT DS;"OPEN";FS:PRINT DS;"WRITE";FS
4110 FOR W = 1 TO 19*ML(M):PRINT QS;AS(W);QS:NEXT W
4120 FOR W = 1 TO 60:PRINT QS;EV$(W);QS:NEXT W
4130 PRINT DS;"CLOSE";FS:GOSUB 1300:RETURN
4140 GOSUB 1100:RESUME
5000 EX = LEN(TS):INVERSE:VTAB WY:HTAB WX
5010 IF FL = EX THEN PRINT TS:GOTO 5060
5020 PRINT TS;LEFT$(CL$,FL-EX)
5030 IF EX = FL THEN 5060
5040 VTAB WY:HTAB WX+EX:PRINT SP$
5050 VTAB WY:HTAB WX+EX:NORMAL:PRINT SP$:INVERSE
5060 K = PEEK(-16384)-128:IF K < 0 THEN 5030
5070 POKE -16368,0:KS = CHR$(K)
5080 IF KS = CHR$(26) THEN TS = "":GOTO 5000
5090 IF KS = CHR$(127) THEN 5140
5100 IF KS < SP$ THEN 5170
5110 IF EX = FL THEN PRINT GS;:GOTO 5060
5120 TS = TS+KS:VTAB WY:HTAB WX+EX:PRINT KS
5130 EX = EX+1:GOTO 5030
5140 IF EX = 0 THEN PRINT GS;:GOTO 5060
5150 IF EX = 1 THEN TS = "":GOTO 5000
5160 TS = MID$(TS,1,EX-1):GOTO 5000
5170 NORMAL:IF KS = CHR$(13) THEN KS = CHR$(10)
5180 VTAB WY:HTAB WX:PRINT TS;LEFT$(CL$,FL-LEN(TS)+1)
5190 RETURN

```

Commodore 64 & 128 (C 64 mode) w/disk drive/ Schedule Planner Setup Program

```

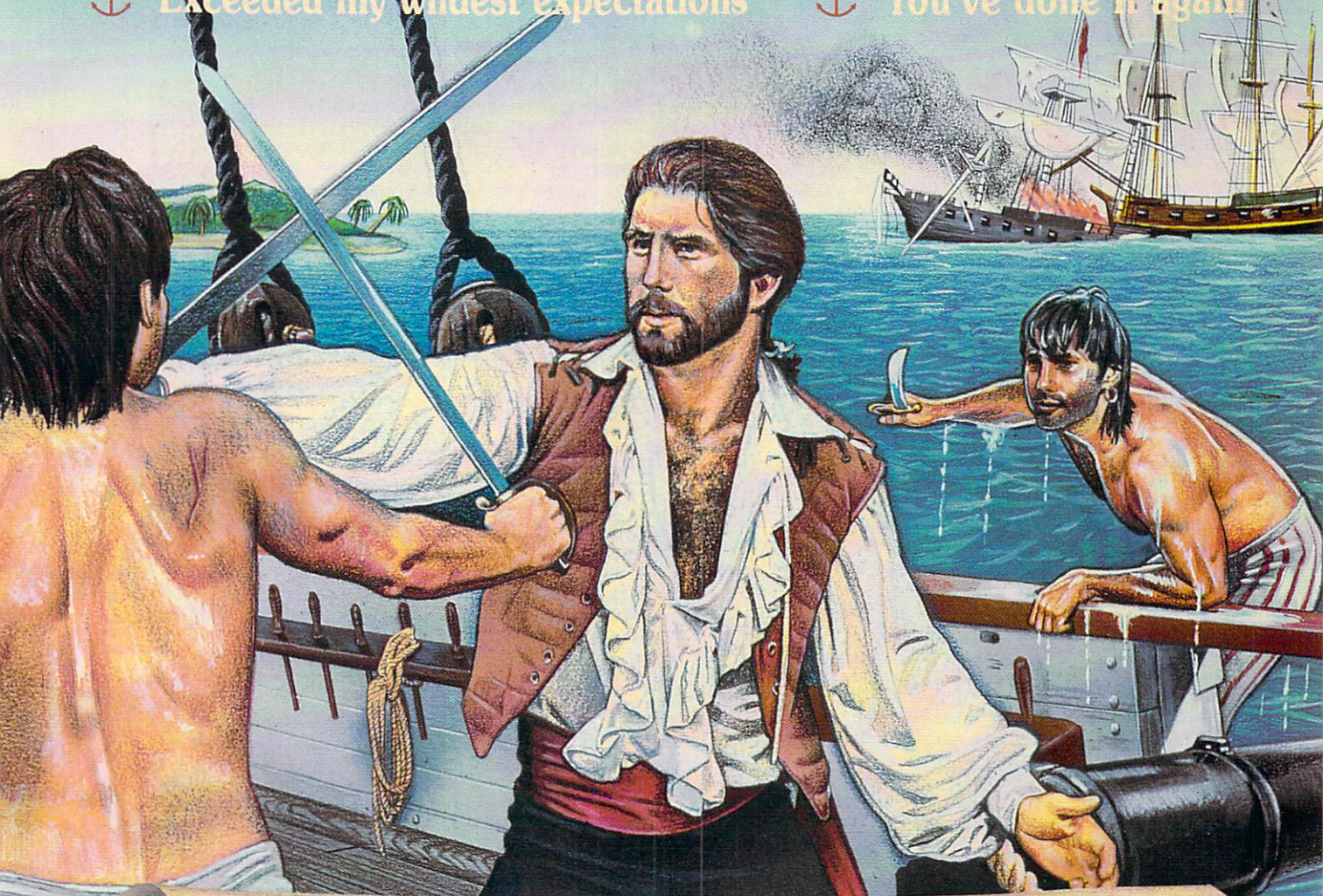
10 DIM ML(12),WP(12),FT$(12),MO$(12),NMS(31)
20 DIM TMS(14):CLOSE 2:CLOSE 15:CS$=CHR$(147)
30 ES$="<"+CHR$(95)+">":QS=CHR$(34):SP$=CHR$(32)
40 DA$=CHR$(96):FOR L=2 TO 37:DA$=DA$+CHR$(96):NEXT L
50 UL$=CHR$(95):FOR L=2 TO 28:UL$=UL$+CHR$(95):NEXT L
60 FOR L=1 TO 12:READ MO$(L),ML(L):NEXT L
70 FOR L=1 TO 31:TS="":IF L<10 THEN TS=SP$
80 NMS(L)=QS+TS+MID$(STR$(L),2)+SP$+QS:NEXT L
90 C=7:FOR L=1 TO 14
100 Z$=MID$(STR$(C),2):IF C<10 THEN Z$=SP$+Z$
110 TMS(L)=QS+Z$+"00":C=C+1:IF C>12 THEN C=1
120 NEXT L:TS="A"+SP$:FOR L=1 TO 14
130 TMS(L)=TMS(L)+TS+QS:IF L=5 THEN TS="P"+SP$
140 NEXT L

```


Adventure Gamers Applaud *Pirates!*

⚓ "Excellent... enormously good fun"
⚓ "Exceeded my wildest expectations"

⚓ "Magnificent game"
⚓ "You've done it again"



"**PIRATES!** is excellent... a great swashbuckling game, enormously good fun... it should keep you playing for months."
(Popular Computing Weekly, U.K.)

"... your game has exceeded my wildest expectations... I have run up more game time on the computer in 3 days than in the entire month previous."
(C.J.M., Buffalo, N.Y.)

"This is one of the most magnificent games I have ever had the pleasure of playing! It has exactly the balance of realism, playability and silliness that I most adore."
(J.P.S., San Diego, CA)

"**PIRATES!** is a big hit in the Dallas area. This game is one of your best efforts. The graphics on all screens are excellent! You have done it again, Microprose."
(Larry Medlin, DallasGamers, in Game News)

PIRATES! It's another winner from Sid Meier, author and designer of the award-winning F-15 STRIKE EAGLE and SILENT SERVICE. His creative genius has combined the best of simulation, role-playing and strategy games in this high seas adventure.

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PRODUCTIVITY PROGRAM

```

150 PRINT CSS;
160 INPUT "WHAT YEAR IS THIS SCHEDULE FOR";Y
170 IF Y<1802 OR Y>2398 THEN GOTO 160
180 ML(2)=28-(Y/4=INT(Y/4) AND Y/100<>INT(Y/100)) OR
Y=2000)
190 FOR M=1 TO 12:SY=Y:SM=M
200 IF SM<3 THEN SM=SM+12:SY=SY-1
210 T=INT(SY*1.25)-(SY<1900)-(SY>2000)*INT((SY-2000)/1
00)+INT((SM-2)*2.59)
220 WP(M)=T+1-INT(T/7)*7
230 FTS(M)=LEFT$(MOS(M),3)+MID$(STR$(Y),4)+"SCH.APP"
240 NEXT M:PRINT CSS;
250 L=1:GOSUB 1000:FS="SCHEDULE.DAT":GOSUB 2000
260 POKE 214,10:PRINT:PRINT TAB(9);"CREATING ";FS
270 OPEN 2,8,2,FL$+"W":FOR L=1 TO 31:PRINT#2,NMS(L)
280 NEXT L:FOR L=1 TO 12:PRINT#2,FTS(L)
290 PRINT#2,MOS(L):PRINT#2,ML(L):PRINT#2,WP(L):NEXT L
300 FOR L=1 TO 14:PRINT#2,TMS(L):NEXT L:TS=QS+QS
310 PRINT#2,DA$:PRINT#2,UL$:PRINT#2,CHRS(125)
320 PRINT#2,"<CURSOR UP/DN> <CURSOR LT/RT> <RETURN>"
330 PRINT#2,"<P>PRINT <Q>QUIT"
340 PRINT#2,ES;" <CTRL+E> <CTRL+N> <CTRL+P>"
350 PRINT#2,"<CTRL+Z> <CURSOR UP/DN> <CURSOR LT/RT>"
360 PRINT#2,ES;" <CTRL+D> <CTRL+Z> <CURSOR UP/DN>"
370 PRINT#2,"<CURSOR LT/RT>"
380 PRINT#2,ES;" <CTRL+A> <CTRL+D> <CTRL+E>"
390 PRINT#2,"<CTRL+P> <CTRL+Z> <CURSOR UP/DN>"
400 PRINT#2,Y:CLOSE 2
410 FOR L=1 TO 3:PRINT CSS;:IF L>1 THEN GOSUB 1000
420 FOR M=L*4-3 TO L*4:FS=FTS(M)
430 POKE 214,10:PRINT:PRINT TAB(9);"CREATING ";FS
440 GOSUB 2000:OPEN 2,8,2,FL$+"W"
450 FOR N=1 TO ML(M)*19+60:PRINT#2,TS:NEXT N
460 CLOSE 2:NEXT M,L:PRINT CSS:END
1000 PRINT "INSERT DATA DISK #";L;"IN DISK DRIVE."
1010 PRINT:PRINT "PRESS <SPACE BAR> TO CONTINUE."
1020 GET K$:IF K$<>SP$ THEN 1020
1030 PRINT CSS:FS="DATADISK."+CHRS(48+L):GOSUB 2000
1040 OPEN 2,8,2,FL$+"W":CLOSE 2:RETURN
2000 FL$="0:"FS$="S":OPEN 2,8,2,FL$+"R":CLOSE 2
2010 OPEN 15,8,15:INPUT#15,ER,ER$:CLOSE 15
2020 IF ER=62 THEN RETURN
2030 IF ER=0 THEN FL$="0"+FL$:RETURN
2040 PRINT "ERROR";EC;"HAS OCCURRED IN THE PROGRAM."
2050 END
3000 DATA JANUARY,31,FEBRUARY,28,MARCH,31,APRIL,30
3010 DATA MAY,31,JUNE,30,JULY,31,AUGUST,31,SEPTEMBER
3020 DATA 30,OCTOBER,31,NOVEMBER,30,DECEMBER,31

```

Commodore 64 & 128 (C 64 mode) w/disk drive (printer optional)/Schedule Planner Main Program

```

10 DIM ML(12),WP(12),AS$(589),CMS$(4),EV$(60),FTS$(12)
20 DIM MOS(12),MSG$(8),NMS$(31),TMS$(14):CLOSE 15
30 POKE 649,10:POKE 650,128:POKE 53280,0:POKE 53281,0
40 CES=CHRS(5):CPS=CHRS(16):CSS=CHRS(147):DS=CHRS(4)
50 ES=CHRS(95):QS=CHRS(34):GYS=CHRS(152):RD$=CHRS(150)
60 RV$=CHRS(18):SP$=CHRS(32):WHS=CHRS(4)
70 CL$=SP$:FOR L=2 TO 39:CL$=CL$+SP$:NEXT L
80 DK$=CHRS(145)+CHRS(17)+CHRS(157)+CHRS(29)
90 CMS(1)="PQ"+CHRS(13)+DK$
100 CMS(2)=DK$+ES+CP$+CES+CHRS(14):CMS(3)=DK$+ES+DS
110 CMS(4)=LEFT$(DK$,2)+CHRS(1)+ES+DS+CP$+CES
120 PRINT CSS:TAB(9);GYS;"SCHEDULE PLANNER"
130 M=1:GOSUB 1000:FS="SCHEDULE.DAT"
140 POKE 214,1:PRINT:PRINT TAB(7);"LOADING ";FS;"."
150 GOSUB 1100:OPEN 2,8,2,FL$+"R"
160 FOR L=1 TO 31:INPUT#2,NMS(L):NEXT L:FOR L=1 TO 12
170 INPUT#2,FTS(L),MOS(L),ML(L),WP(L):NEXT L
180 FOR L=1 TO 14:INPUT#2,TMS(L):NEXT L
190 INPUT#2,DA$,UL$,VS:FOR L=1 TO 8:INPUT#2,TS
200 MSG$(L)=TS+LEFT$(CL$,39-LEN(TS)):NEXT L
210 INPUT#2,CY:CLOSE 2:M=1:CD=1:WF=0
220 PRINT CSS;MP=1:GOSUB 1500:GOSUB 3000
230 GOSUB 1600:GOSUB 1700:IF CK=0 THEN 230
240 IF CK<3 THEN PRINT CSS;
250 ON CK GOTO 270,430,450

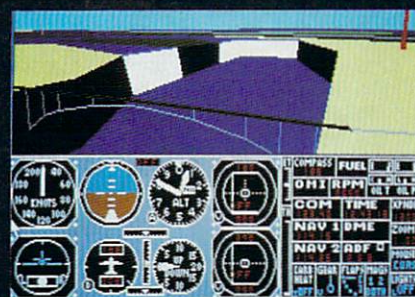
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```

260 CK=CK-3:GOSUB 1800:GOTO 230
270 LS=1:GOSUB 4010:PRINT CSS;
280 PRINT "PRINT THIS MONTH'S <A>PPOINTMENTS/NOTES"
290 PRINT "OR THE <S>PECIAL EVENTS?"
300 GOSUB 1600:IF K$=ES THEN 220
310 IF K$<>"A" AND K$<>"S" THEN 300
320 PRINT CSS;:CS=K$:GOSUB 1900:IF K$=ES THEN 220
330 OPEN 4,4:IF CS="S" THEN 380
340 FOR D=1 TO ML(M):GOSUB 2000
350 IF D/2=INT(D/2) THEN FOR W=1 TO 6:PRINT#4:NEXT W
360 NEXT D:IF ML(M)/2=INT(ML(M)/2) THEN 220
370 FOR L=1 TO 36:PRINT#4:NEXT L:GOTO 420
380 PRINT#4,"SPECIAL EVENTS FOR ";MOS(M);",";CY
390 C=1:FOR W=1 TO 60:TS=EV$(W)
400 IF TS<>" " THEN PRINT#4,TS:C=C+1
410 NEXT W:FOR W=1 TO 66-C:PRINT#4:NEXT W
420 CLOSE 4:GOTO 220
430 PRINT "ARE SURE YOU WANT TO QUIT?":GOSUB 1600
440 ON -(K$<>"Y") GOTO 220:PRINT CSS:END
450 WF=-1:LS=1:GOSUB 4000
460 TM=0:LM=0:WW=37:WH=20:PRINT WH$;:GOSUB 2100
470 GOSUB 3140:PG=1:AP=1:NP=1:A=1:B=14
480 POKE 214,15:PRINT WH$
490 PRINT CHRS(171);DA$;CHRS(179):POKE 214,15:PRINT
500 PRINT TAB(15);" NOTES ":GOSUB 2200:GOSUB 2300
510 FG=-1:MP=2:GOSUB 1500:WX=9:WY=AP:FL=28
520 V=19*CD-19+AP:TS=AS(V):GOSUB 5000
530 AS(V)=TS:GOSUB 1700:IF CK=0 THEN 520
540 ON CK GOTO 550,550,570,570,600,610,640,870
550 DY=(CK-1)-(CK=2):AP=AP+DY:WY=WY+DY
560 IF AP>0 AND AP<15 THEN 520
570 CK=CK+(CK>2)*2:GOSUB 1800:GOSUB 1500
580 AP=1:A=1:B=14:GOSUB 2200
590 WY=1:GOSUB 2300:GOTO 520
600 LS=2:GOSUB 4000:WF=0:GOTO 220
610 GOSUB 1400:GOSUB 1900:IF K$=ES THEN 630
620 D=CD:OPEN 4,4:GOSUB 2000:CLOSE 4
630 MP=4+FG*2:GOSUB 1500:ON -FG GOTO 520:GOTO 890
640 TM=2-FG*7:LM=2
650 WW=33:WH=10:FL=33:PRINT RD$;:GOSUB 2100
660 WX=3:WY=TM+1:TS=" SPECIAL EVENTS FOR "+MOS(M)+SP$
670 POKE 214,15:PRINT
680 PRINT TAB(1+INT((39-LEN(TS))/2));RV$:TS
690 MP=3:GOSUB 1500:P=0:EP=1
700 POKE 214,15:PRINT
710 FOR W=P*10+1 TO P*10+10:TS=EV$(W)
720 PRINT TAB(3);TS;LEFT$(CL$,33-LEN(TS)):NEXT W
730 PRINT TAB(15);CHRS(154);" PAGE";STR$(P+1);SP$
740 V=P*10+EP:TS=EV$(V):GOSUB 5000
750 EV$(V)=TS:GOSUB 1700:IF CK=0 THEN 740
760 ON CK GOTO 770,770,800,800,820,840
770 DY=(CK-1)-(CK=2):EP=EP+DY
780 IF EP>0 AND EP<11 THEN WY=WY+DY:GOTO 740
790 CK=3-(EP=9)
800 P=P+(CK=3)-(CK=4):P=P+((P=6)-(P=-1))*6
810 WY=TM+1:EP=1:GOTO 700
820 TM=0:LM=2:IF FG THEN A=9:B=14:GOTO 480
830 A=2:B=13:GOSUB 2200:GOTO 880
840 IF V=60 THEN 860
850 FOR W=V TO 59:EV$(W)=EV$(W+1):NEXT W
860 EV$(60)="":GOTO 700
870 FG=0
880 MP=4:GOSUB 1500:WX=2:WY=15+NP:FL=35
890 V=19*CD-5+NP:TS=AS(V):GOSUB 5000
900 AS(V)=TS:GOSUB 1700:IF CK=0 THEN 890
910 ON CK GOTO 920,920,510,600,940,610,640
920 NP=NP+(CK=1)-(CK=2)
930 NP=NP+((NP=6)-(NP=0))*5:WY=15+NP:GOTO 890
940 T=19*CD:IF V=T THEN 960
950 FOR W=V TO T-1:AS(W)=AS(W+1):NEXT W
960 AS(T)="":GOSUB 2300:GOTO 890
1000 FS="DATADISK."+CHRS(48+INT((M+3)/4))
1010 GOSUB 1100:IF EC=0 THEN RETURN
1020 IF EC>62 THEN GOSUB 1200:GOTO 1010
1030 POKE 214,22:PRINT

```


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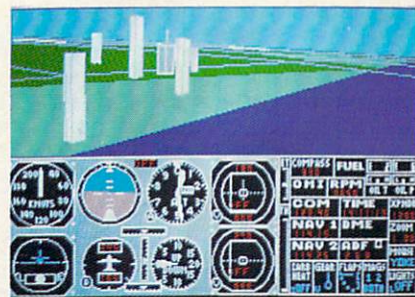
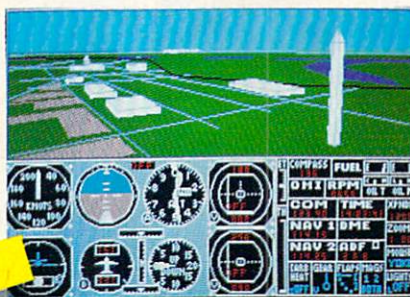
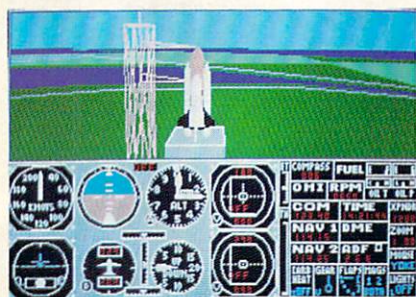
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PRODUCTIVITY PROGRAM

```

1040 PRINT WH$;"INSERT DATA DISK #";INT((M+3)/4);"IN D
RIVE.";GYS
1050 GOSUB 1300:GOSUB 1400:GOTO 1010
1100 FL$="0:"F$+"",S":OPEN 2,8,2,FL$+"",R":CLOSE 2
1110 OPEN 15,8,15:INPUT#15,EC,ERS:CLOSE 15:RETURN
1200 POKE 214,22:PRINT RD$
1210 PRINT "ERROR";STR$(EC);" HAS OCCURRED IN THE PROG
RAM.";GYS
1220 GOSUB 1300:GOSUB 1400:RETURN
1300 PRINT "PRESS <SPACE BAR> TO CONTINUE.";
1310 GOSUB 1600:ON -(K<>SP$) GOTO 1310:RETURN
1400 POKE 214,22:PRINT:PRINT CL$:PRINT CL$:RETURN
1500 POKE 214,22:PRINT:PRINT CHR$(155);MSG$(MP*2-1)
1510 PRINT MSG$(MP*2);GYS;:RETURN
1600 GET K$:IF K$="" THEN 1600
1610 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32):RETURN
1700 CK=0:FOR L=1 TO LEN(CMS(MP))
1710 IF MID$(CMS(MP),L,1)=K$ THEN CK=L:L=10
1720 NEXT L:RETURN
1800 ON CK GOTO 1810,1840,1870,1870
1810 CD=CD-1:IF CD>0 THEN GOSUB 3140:RETURN
1820 LS=2:GOSUB 4000:M=M-1
1830 M=M-(M=0)*12:CD=ML(M):GOTO 1890
1840 CD=CD+1:IF CD<=ML(M) THEN GOSUB 3140:RETURN
1850 LS=2:GOSUB 4000:CD=1:M=M+1
1860 M=M+(M=13)*12:GOTO 1890
1870 M=M+(CK=3)-(CK=4):M=M+((M=13)-(M=0))*12
1880 IF CD>ML(M) THEN CD=ML(M)
1890 LS=1:GOSUB 4000:GOSUB 3000:RETURN
1900 POKE 214,22:PRINT
1910 PRINT "PLEASE PRESS <SPACE BAR> WHEN"
1920 PRINT "PRINTER IS READY OR <";E$;"> TO EXIT.";
1930 GOSUB 1600:IF K$<>E$ AND K$<>SP$ THEN 1930
1940 GOSUB 1400:RETURN
2000 PRINT#4,MOS(M);D$;"",CY
2010 PRINT#4,"DAILY APPOINTMENTS":PRINT#4:P=D*19-18
2020 FOR W=P TO P+13:TS=TMS(W-P+1)+A$(W)
2030 IF LEN(TS)=7 THEN TS=TS+UL$
2040 PRINT#4,TS:NEXT W:PRINT#4:PRINT#4
2050 PRINT#4,"NOTES":PRINT#4
2060 FOR W=P+14 TO P+18:PRINT#4,A$(W):NEXT W
2070 FOR W=1 TO 4:PRINT#4:NEXT W:RETURN
2100 POKE 214,TM:PRINT
2110 PRINT TAB(LM);CHR$(176);LEFT$(DAS,WW);CHR$(174)
2120 FOR W=1 TO WH
2130 PRINT TAB(LM);V$;LEFT$(CL$,WW);V$:NEXT W
2140 PRINT TAB(LM);CHR$(173);LEFT$(DAS,WW);CHR$(189)
2150 RETURN
2200 POKE 214,A:PRINT:FOR W=A TO B:TS=A$(19*CD-19+W)
2210 PRINT TAB(2);CHR$(153);TMS(W);GYS;TS;LEFT$(CL$,28
-LEN(TS))
2220 NEXT W:RETURN
2300 POKE 214,16:PRINT:FOR W=1 TO 5:TS=A$(19*CD+W-5)
2310 PRINT TAB(2);TS;LEFT$(CL$,35-LEN(TS))
2320 NEXT W:RETURN
3000 IF WF THEN 3140
3010 POKE 214,0:PRINT
3020 TS=SP$+MOS(M)+STR$(CY)+SP$:T=11-INT(LEN(TS)/2)
3030 PRINT CHR$(176);LEFT$(DAS,T);TS;LEFT$(DAS,22-T-LE
N(TS));CHR$(174)
3040 PRINT V$;" S M T W T H F S ";V$
3050 PRINT CHR$(171);LEFT$(DAS,22);CHR$(179)
3060 C=1:P=WP(M)-1:TS=V$+LEFT$(CL$,P*3+1)
3070 FOR D=1 TO ML(M):IF P<>7 THEN 3090
3080 P=0:PRINT TS;V$:C=C+1:TS=V$+SP$
3090 P=P+1:TS=TS+NMS(D):NEXT D
3100 IF P<7 THEN TS=TS+LEFT$(CL$,21-P*3)
3110 PRINT TS;V$
3120 PRINT CHR$(173);LEFT$(DAS,22);CHR$(189);GYS
3130 IF C<>6 THEN FOR S=C+1 TO 6:PRINT CL$:NEXT S
3140 TS=MOS(M)+STR$(CD)+","+STR$(CY)+SP$
3150 IF WF THEN 3180
3160 POKE 214,10:PRINT
3170 PRINT CHR$(158);"DATE: ";TS;GYS;SP$;SP$:RETURN
3180 TS=" APPOINTMENTS FOR "+TS:T=LEN(TS)
3190 Z=INT((37-T)/2):PRINT CHR$(19);WH$

```

```

3200 PRINT TAB(1);LEFT$(DAS,Z);TS;LEFT$(DAS,37-Z-T)
3210 RETURN
4000 IF NOT WF THEN RETURN
4010 GOSUB 1400:GOSUB 1000
4020 FS=FT$(M):GOSUB 1100:IF EC<>0 THEN 4130
4030 IF LS=2 THEN 4080
4040 POKE 214,22:PRINT:PRINT "LOADING ";FS;". "
4050 OPEN 2,8,2,FL$+"",R"
4060 FOR W=1 TO 19*ML(M):INPUT#2,A$(W):NEXT W
4070 FOR W=1 TO 60:INPUT#2,EV$(W):NEXT W:GOTO 4120
4080 POKE 214,22:PRINT:PRINT "SAVING ";FS;". "
4090 OPEN 2,8,2,"0"+FL$+"",W"
4100 FOR W=1 TO 19*ML(M):PRINT#2,Q$;A$(W);Q$:NEXT W
4110 FOR W=1 TO 60:PRINT#2,Q$;EV$(W);Q$:NEXT W
4120 CLOSE 2:GOSUB 1400:RETURN
4130 GOSUB 1200:GOSUB 1400:GOTO 4010
5000 EX=LEN(TS):POKE 214,WY:PRINT
5010 PRINT TAB(WX);RV$;CHR$(159);TS;LEFT$(CL$,FL-EX)
5020 IF EX=FL THEN 5050
5030 POKE 214,WY:PRINT:PRINT TAB(WX+EX);SP$
5040 POKE 214,WY:PRINT:PRINT TAB(WX+EX);RV$;SP$
5050 GET K$:IF K$="" THEN 5020
5060 IF K$=CHR$(26) THEN TS="":GOTO 5000
5070 IF K$=CHR$(20) THEN 5130
5080 IF K$<SP$ OR K$>CHR$(93) THEN 5160
5090 IF EX=FL THEN 5050
5100 TS=TS+K$
5110 POKE 214,WY:PRINT:PRINT TAB(WX+EX);RV$;K$
5120 EX=EX+1:GOTO 5020
5130 IF EX=0 THEN 5050
5140 IF EX=1 THEN TS="":GOTO 5000
5150 TS=MID$(TS,1,EX-1):GOTO 5000
5160 IF K$=CHR$(13) THEN K$=CHR$(17)
5170 POKE 214,WY:PRINT GYS
5180 PRINT TAB(WX);TS;LEFT$(CL$,FL-LEN(TS)):RETURN

```

IBM PC & compatibles/Schedule Planner Setup Program

```

10 DEFINT A-Z:OPTION BASE 1:DIM ML(12)
20 DIM FT$(12),MOS(12),NMS(31),PL$(360),TMS(28)
30 SCREEN 0,0:WIDTH 80:LOCATE ,0:KEY OFF:COLOR 2,0
40 VB$=CHR$(179):SP$=CHR$(32)
50 FOR L=1 TO 12:READ MOS(L),ML(L):NEXT L
60 FOR L=1 TO 31:TS="":IF L<10 THEN TS=SP$
70 NMS(L)=TS+MID$(STR$(L),2)+SP$:NEXT L
80 C=7:FOR L=1 TO 27 STEP 2
90 IF C<10 THEN Z$=SP$ ELSE Z$=""
100 TMS(L)=Z$+MID$(STR$(C),2)+":00"
110 TMS(L+1)=Z$+MID$(STR$(C),2)+":30"
120 C=C+1:IF C>12 THEN C=1
130 NEXT L:TS="A"+SP$:FOR L=1 TO 28
140 TMS(L)=TMS(L)+TS:IF L=10 THEN TS="P"+SP$
150 NEXT L
160 CL$:INPUT "What year is this schedule for";Y
170 IF Y<1802 OR Y>2398 THEN BEEP:GOTO 160
180 W=1:FOR L=Y-1 TO Y+1:ML(2)=28-((L MOD 4=0) AND (L
MOD 10<>0)) OR L=2000
190 CL$:PRINT "Creating calendar for";STR$(L);"; pleas
e wait."
200 FOR M=1 TO 12:SY=L:SM=M
210 IF SM<3 THEN SM=SM+12:SY=SY-1
220 T=INT((SY*1.25)-(SY<1900)-(SY>2000)*INT((SY-2000)/1
00)+INT((SM-2)*2.59)
230 DAY=1+T MOD 7:V=(W-1)*120+(M-1)*10+1:C=V
240 TS=SP$+MOS(M)+STR$(L)+SP$:T=11-INT(LEN(TS)/2)
250 PL$(C)=CHR$(213)+STRING$(T,205)+TS+STRING$(22-T-LE
N(TS),205)+CHR$(184)
260 C=C+1:PL$(C)=VB$+" S M T W T H F S "+VB$
270 C=C+1:PL$(C)=CHR$(195)+STRING$(22,196)+CHR$(180)
280 C=C+1:P=DAY-1:PL$(C)=VB$+SPACES(P*3+1)
290 FOR D=1 TO ML(M):IF P<>7 THEN 310
300 P=0:PL$(C)=PL$(C)+VB$:C=C+1:PL$(C)=VB$+SP$
310 P=P+1:PL$(C)=PL$(C)+NMS(D)
320 NEXT D:PL$(C)=PL$(C)+SPACES(21-P*3)+VB$
330 C=C+1:PL$(C)=CHR$(212)+STRING$(22,205)+CHR$(190)

```


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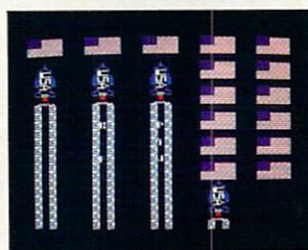
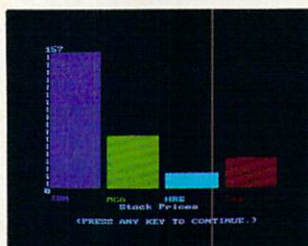
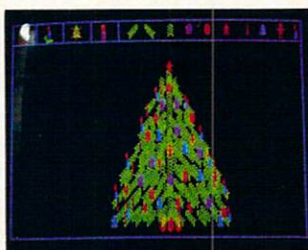
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PRODUCTIVITY PROGRAM

```

340 IF C=V+9 THEN 360
350 FOR S=C+1 TO V+9:PL$(S)=SPACES(24):NEXT S
360 NEXT M:W=W+1:NEXT L:FOR M=1 TO 12
370 FT$(M)=LEFT$(MOS(M),3)+MID$(STR$(Y),4)+"SCH.APP"
380 NEXT M:CLS:ON ERROR GOTO 580
390 L=1:GOSUB 1000
400 LOCATE 12,30:PRINT "CREATING SCHEDULE.DAT"
410 OPEN "SCHEDULE.DAT" FOR OUTPUT AS #1
420 FOR L=1 TO 360:WRITE#1,PL$(L):NEXT L
430 FOR L=1 TO 12:WRITE#1,FT$(L),MOS(L),ML(L)
440 NEXT L:FOR L=1 TO 28:WRITE#1,TM$(L):NEXT L
450 WRITE#1,CHR$(27),CHR$(186)
460 WRITE#1,"<CURSOR UP/DN> <CURSOR LT/RT> <ENTER> <C>
ALNDAR <P>RINT <Q>UIT"
470 WRITE#1,"<ESC> <CURSOR LT/RT>"
480 WRITE#1,"<ESC> <CTRL+E> <CTRL+N> <CTRL+P> <CTRL+Z>
<CURSOR UP/DN> <CURSOR LT/RT>"
490 WRITE#1,"<ESC> <CTRL+D> <CTRL+Z> <CURSOR UP/DN> <C
URSOR LT/RT>"
500 WRITE#1,"<ESC> <CTRL+A> <CTRL+D> <CTRL+E> <CTRL+P>
<CTRL+Z> <CURSOR UP/DN>"
510 WRITE#1,Y:CLOSE#1
520 FOR L=1 TO 2:CLS:IF L=2 THEN GOSUB 1000
530 FOR M=L*6-5 TO L*6
540 LOCATE 12,30:PRINT "CREATING ";FT$(M)
550 OPEN FT$(M) FOR OUTPUT AS #1
560 FOR N=1 TO ML(M)*33+64:WRITE#1,"":NEXT N
570 CLOSE#1:NEXT M,L:ON ERROR GOTO 0:CLS:KEY ON:END
580 CLOSE#1:PRINT "Error";ERR;"has occurred in line";S
TR$(ERR);"."
590 BEEP:BEEP:RESUME 600
600 ON ERROR GOTO 0:KEY ON:END
1000 BEEP:PRINT "Insert data disk #";L;"in current dis
k drive."
1010 PRINT:PRINT "Press <SPACE BAR> to continue."
1020 IF INKEY$<>SP$ THEN 1020
1030 CLS:TS="DATADISK."+CHR$(48+L)
1040 OPEN TS FOR OUTPUT AS #1:CLOSE#1:RETURN
2000 DATA JANUARY,31,FEBRUARY,28,MARCH,31,APRIL,30
2010 DATA MAY,31,JUNE,30,JULY,31,AUGUST,31,SEPTEMBER
2020 DATA 30,OCTOBER,31,NOVEMBER,30,DECEMBER,31

```

IBM PC & compatibles (printer optional)/Schedule Planner Main Program

```

10 DEFINT A-Z:OPTION BASE 1
20 DIM ML(12),AS(1023),EV$(64),FT$(12),MOS(12)
30 DIM MSG$(5),PL$(360),TM$(28)
40 KEY OFF:SCREEN 0,0:WIDTH 80
50 COLOR 2,0:CLS=SPACES(38):SP$=CHR$(32):CLS
60 PRINT TAB(10);"SCHEDULE PLANNER":M=1:GOSUB 2000
70 LOCATE 3,8:PRINT "LOADING SCHEDULE.DAT."
80 ON ERROR GOTO 160
90 OPEN "SCHEDULE.DAT" FOR INPUT AS #1
100 FOR L=1 TO 360:INPUT#1,PL$(L):NEXT L
110 FOR L=1 TO 12:INPUT#1,FT$(L),MOS(L),ML(L)
120 NEXT L:FOR L=1 TO 28:INPUT#1,TM$(L):NEXT L
130 INPUT#1,ES,V$:FOR L=1 TO 5:INPUT#1,TS
140 MSG$(L)=TS+SPACES(79-LEN(TS)):NEXT L:INPUT#1,CY
150 CLOSE#1:ON ERROR GOTO 0:GOTO 180
160 CLOSE#1:BEEP:EC=ERR:EL=ERL:RESUME 170
170 ON ERROR GOTO 0:GOSUB 2100:GOTO 80
180 CLS:M=VAL(MID$(DATES,1,2))
190 CD=VAL(MID$(DATES,4,2)):WF=0:GOSUB 2300
200 CLS:MP=1:GOSUB 2500:GOSUB 2600
210 GOSUB 2700:IF LEN(K$)=1 THEN 250
220 CK=INSTR("HPKM",MID$(K$,2))
230 IF CK=0 THEN BEEP:GOTO 210
240 GOSUB 2800:GOTO 210
250 CK=INSTR("CPQ"+CHR$(13),K$)
260 IF CK=0 THEN BEEP:GOTO 210
270 IF CK<4 THEN CLS
280 ON CK GOTO 290,400,580,600
290 MP=2:GOSUB 2500:V=CY-1:P=2
300 COLOR 15:LOCATE 1,38:PRINT V+INT(P/2):COLOR 2
310 PRINT:T=P*60+1:FOR Z=T TO T+30 STEP 30
320 FOR Y=Z TO Z+9:FOR X=Y TO Y+20 STEP 10

```

```

330 PRINT SP$:SP$:PL$(X):NEXT X:PRINT:NEXT Y,Z
340 GOSUB 2700:IF LEN(K$)=2 THEN 370
350 IF K$=E$ THEN CLS:GOSUB 2300:GOTO 200
360 BEEP:GOTO 340
370 CK=INSTR("KM",MID$(K$,2))
380 IF CK=0 THEN BEEP:GOTO 340
390 P=P+(CK=1)-(CK=2):P=P+((P=6)-(P=1))*6:GOTO 300
400 LS=1:GOSUB 4010:CLS
410 PRINT "Print this month's <A>ppointments/notes or"
420 PRINT "the <S>pecial events?";
430 GOSUB 2700:IF K$=E$ THEN 200
440 IF K$<>"A" AND K$<>"S" THEN BEEP:GOTO 430
450 CLS:C$=K$:GOSUB 2900:IF K$=E$ THEN 200
460 ON ERROR GOTO 520
470 IF C$="S" THEN 540
480 FOR D=1 TO ML(M):GOSUB 3000
490 IF D MOD 2=0 THEN FOR W=1 TO 6:LPRINT:NEXT W
500 NEXT D:IF ML(M) MOD 2=0 THEN 200
510 FOR L=1 TO 36:LPRINT:NEXT L:GOTO 200
520 BEEP:EC=ERR:EL=ERL:RESUME 530
530 ON ERROR GOTO 0:GOSUB 2100:CLS:GOTO 400
540 LPRINT "SPECIAL EVENTS FOR ";MOS(M);",";CY
550 C=1:FOR W=1 TO 64:TS=EV$(W)
560 IF TS<>" " THEN LPRINT TS:C=C+1
570 NEXT W:FOR W=1 TO 66-C:LPRINT:NEXT W:GOTO 200
580 PRINT "Are sure you want to quit?":GOSUB 2700
590 IF K$<>"Y" THEN 200 ELSE COLOR 7:CLS:KEY ON:END
600 WF=-1:LS=1:GOSUB 4000
610 TM=1:LM=40:WW=37:WH=20:COLOR 15:GOSUB 3200
620 TM=13:LM=1:LOCATE 16,40
630 PRINT CHR$(204);STRING$(37,205);CHR$(185)
640 LOCATE 16,56:PRINT "NOTES ":GOSUB 2620
650 PG=1:AP=1:NP=1:GOSUB 3300:GOSUB 3350
660 FG=-1
670 MP=3:GOSUB 2500:WX=49:WY=1+AP+(AP>14)*14:FL=28
680 V=33*CD-33+AP:TS=AS(V):GOSUB 5000
690 AS(V)=TS:IF LEN(K$)=1 THEN 830
700 CK=INSTR("HPKM",MID$(K$,2))
710 IF CK=0 THEN BEEP:GOTO 680
720 IF CK>2 THEN 800
730 DY=(CK=1)-(CK=2):AP=AP+DY:WY=WY+DY
740 IF (PG=1 AND AP>0 AND AP<15) OR (PG=2 AND AP>14 AND
AP<29) THEN 680
750 IF PG=2 THEN 780
760 PG=2:IF AP=0 THEN GOSUB 2810
770 GOTO 820
780 PG=1:IF AP=29 THEN GOSUB 2840
790 GOTO 820
800 PG=PG+(CK=3)-(CK=4):IF PG=1 OR PG=2 THEN 820
810 IF PG=0 THEN PG=2:GOSUB 2810 ELSE PG=1:GOSUB 2840
820 GOSUB 3300:WY=2:GOTO 680
830 ON INSTR(ES+CHR$(16)+CHR$(5)+CHR$(14),K$) GOTO 840
,850,910,1160:BEEP:GOTO 680
840 LS=2:GOSUB 4000:WF=0:GOTO 200
850 LOCATE 25,1:PRINT SPACES(79);
860 GOSUB 2900:IF K$=E$ THEN 880
870 ON ERROR GOTO 890:D=CD:GOSUB 3000
880 MP=5+FG*2:GOSUB 2500:IF FG THEN 680 ELSE 1180
890 BEEP:EC=ERR:EL=ERL:RESUME 900
900 ON ERROR GOTO 0:GOSUB 2100:GOTO 860
910 WW=35:WH=8:FL=33:COLOR 4:GOSUB 3200
920 WX=3:WY=14:TS=" SPECIAL EVENTS FOR "+MOS(M)+SP$
930 COLOR 2:LOCATE 13,INT((39-LEN(TS))/2):PRINT TS
940 COLOR 2,0:MP=4:GOSUB 2500:P=0:EP=1
950 COLOR 7:C=1:FOR W=P*8+1 TO P*8+8:TS=EV$(W)
960 LOCATE 13+C,3:PRINT TS:SPACES(33-LEN(TS)):C=C+1
970 NEXT W:COLOR 3:LOCATE 22,15:PRINT "PAGE";P+1;
980 COLOR 4:PRINT CHR$(205):COLOR 7
990 V=P*8+EP:TS=EV$(V):GOSUB 5000
1000 EV$(V)=TS:IF LEN(K$)=2 THEN 1080
1010 ON INSTR(ES+CHR$(4),K$) GOTO 1030,1050
1020 BEEP:GOTO 990
1030 LOCATE 13,1:FOR W=1 TO 10:PRINT CL$
1040 NEXT W:IF FG THEN 670 ELSE 1170
1050 IF V=64 THEN 1070
1060 FOR W=V TO 63:EV$(W)=EV$(W+1):NEXT W

```


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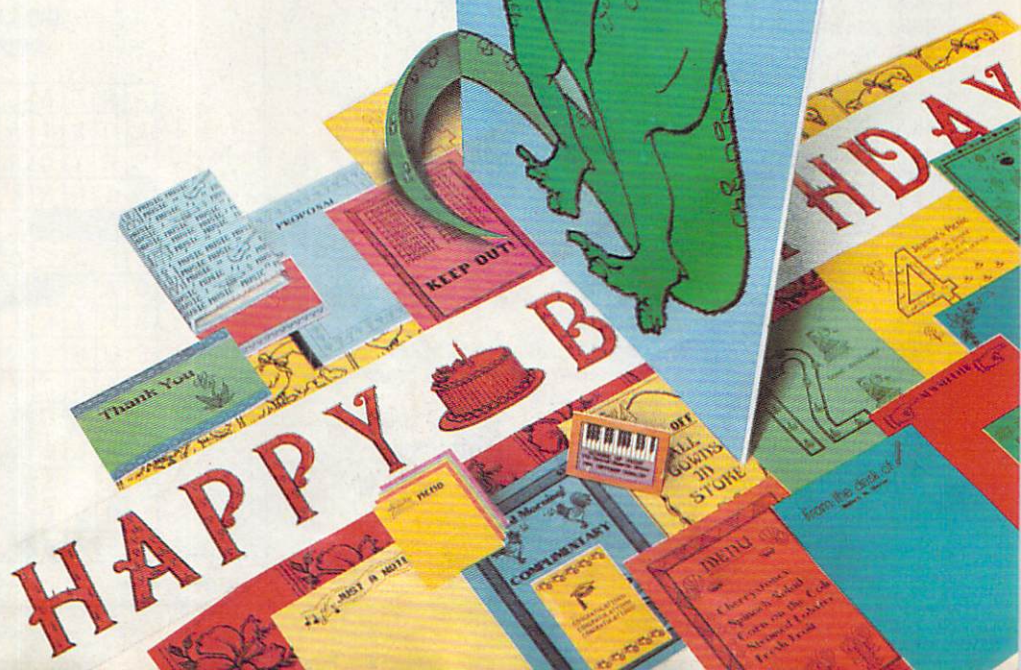
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CIRCLE READER SERVICE 31



PRODUCTIVITY PROGRAM

```

1070 EV$(64)="" : GOTO 950
1080 CK=INSTR("HPKM",MID$(K$,2))
1090 IF CK=0 THEN BEEP:GOTO 990
1100 IF CK>2 THEN 1140
1110 DY=(CK=1)-(CK=2):EP=EP+DY
1120 IF EP>0 AND EP<9 THEN WY=WY+DY:GOTO 990
1130 IF EP=0 THEN CK=3 ELSE CK=4
1140 P=P+(CK=3)-(CK=4):P=P+((P=8)-(P=-1))*8
1150 WY=14:EP=1:GOTO 950
1160 FG=0
1170 MP=5:GOSUB 2500:WX=42:WY=16+NP:FL=35
1180 V=33*CD-5+NP:TS=AS(V):GOSUB 5000
1190 AS(V)=TS:IF LEN(K$)=2 THEN 1240
1200 ON INSTR(CHRS$(1)+ES+CHRS$(4)+CHRS$(16)+CHRS$(5),K$)
GOTO 660,840,1210,850,910:BEEP:GOTO 1180
1210 T=33*CD:IF V=T THEN 1230
1220 FOR W=V TO T-1:AS(W)=AS(W+1):NEXT W
1230 AS(T)="" : GOSUB 3350:GOTO 1180
1240 CK=INSTR("HP",MID$(K$,2))
1250 IF CK=0 THEN BEEP:GOTO 1180
1260 NP=NP+(CK=1)-(CK=2)
1270 NP=NP+((NP=6)-(NP=0))*5:WY=16+NP:GOTO 1180
2000 TS="DATADISK."+CHRS(49-(M>6))
2010 ON ERROR GOTO 2040
2020 OPEN TS FOR INPUT AS #1:CLOSE#1
2030 ON ERROR GOTO 0:RETURN
2040 CLOSE#1:BEEP:EC=ERR:EL=ERL:RESUME 2050
2050 ON ERROR GOTO 0
2060 IF EC<>53 THEN GOSUB 2100:GOTO 2010
2070 LOCATE 18,1:PRINT "Insert data disk #";1-(M>6);"i
n current drive."
2080 GOSUB 2200:GOSUB 2400:GOTO 2010
2100 COLOR 12:LOCATE 18,1
2110 PRINT "Error";EC;"has occurred in line";STR$(EL);
"."
2120 COLOR 2:GOSUB 2200:GOSUB 2400:RETURN
2200 PRINT "Press <SPACE BAR> to continue."
2210 IF INKEY$<>SP$ THEN 2210 ELSE RETURN
2300 COLOR 10:LOCATE 18,1
2310 PRINT "BASIC is doing housecleaning;"
2320 PRINT "please stand by.":FRE(TS)
2330 COLOR 2:GOSUB 2400:RETURN
2400 LOCATE 18,1:PRINT CL$:PRINT CL$:RETURN
2500 LOCATE 25,1:PRINT MSG$(MP);:RETURN
2600 T=M*10+111:LOCATE 1,1:FOR W=T TO T+9
2610 PRINT PL$(W):NEXT W
2620 TS=MOS(M)+STR$(CD)+""+STR$(CY)+SP$:COLOR 14
2630 LOCATE 11,1:PRINT "DATE: ";TS;SP$:SP$
2640 COLOR 2:IF NOT WF THEN RETURN
2650 TS=" APPOINTMENTS FOR "+TS:T=LEN(TS)
2660 A=INT((37-T)/2):COLOR 15:LOCATE 1,41
2670 PRINT STRING$(A,205);TS;STRING$(37-A-T,205)
2680 COLOR 2:RETURN
2700 K$=INKEY$:IF K$="" THEN 2700
2710 IF LEN(K$)=2 THEN RETURN
2720 K=ASC(K$):K$=CHRS(K-(K>96)*32):RETURN
2800 ON CK GOTO 2810,2840,2870,2870
2810 CD=CD-1:IF CD>0 THEN GOSUB 2620:RETURN
2820 LS=2:GOSUB 4000:M=M-1
2830 M=M-(M=0)*12:CD=ML(M):GOTO 2890
2840 CD=CD+1:IF CD<=ML(M) THEN GOSUB 2620:RETURN
2850 LS=2:GOSUB 4000:CD=1:M=M+1
2860 M=M+(M=13)*12:GOTO 2890
2870 M=M+(CK=3)-(CK=4):M=M+((M=13)-(M=0))*12
2880 IF CD>ML(M) THEN CD=ML(M)
2890 LS=1:GOSUB 4000:GOSUB 2500:GOSUB 2500:RETURN
2900 LOCATE 18,1:PRINT "Please press <SPACE BAR> when"
2910 PRINT "printer is ready or <ESC> to exit.:"
2920 GOSUB 2700
2930 IF K$<>ES AND K$<>SP$ THEN BEEP:GOTO 2920
2940 GOSUB 2400:RETURN
3000 LPRINT MOS(M);STR$(D);",";CY
3010 LPRINT "DAILY APPOINTMENTS":LPRINT:P=D*33-32
3020 FOR W=P TO P+13:TS=TMS(W-P+1)+AS(W):GOSUB 3100
3030 Z$=TS+SPACES(5):TS=TMS(W-P+15)+AS(W+14)

```

```

3040 GOSUB 3100:LPRINT Z$;TS:NEXT W:LPRINT:LPRINT
3050 LPRINT "NOTES":LPRINT
3060 FOR W=P+28 TO P+32:LPRINT AS(W):NEXT W
3070 FOR W=1 TO 4:LPRINT:NEXT W:RETURN
3100 IF LEN(TS)=7 THEN TS=TS+STRING$(28,95):RETURN
3110 TS=TS+SPACES(35-LEN(TS)):RETURN
3200 LOCATE TM,LM
3210 PRINT CHRS(201);STRING$(WW,205);CHRS(187)
3220 FOR W=1 TO WH:LOCATE TM+W,LM
3230 PRINT VS;SPACES(WW);VS:NEXT W:LOCATE TM+WH+1,LM
3240 PRINT CHRS(200);STRING$(WW,205);CHRS(188):RETURN
3300 C=2:AP=PG*14-13
3310 FOR W=AP TO AP+13:TS=AS(33*CD-33+W)
3320 LOCATE C,42:PRINT TMS(W);:COLOR 7
3330 PRINT TS;SPACES(28-LEN(TS)):COLOR 2
3340 C=C+1:NEXT W:IF FRE(0)<4000 THEN GOSUB 2300
3350 COLOR 7:FOR W=17 TO 21:TS=AS(33*CD+W-21)
3360 LOCATE W,42:PRINT TS;SPACES(35-LEN(TS))
3370 NEXT W:COLOR 2:RETURN
4000 IF NOT WF THEN RETURN
4010 LOCATE 25,1:PRINT SPACES(79);:GOSUB 2000
4020 COLOR 15:ON ERROR GOTO 4120:IF LS=2 THEN 4070
4030 LOCATE 18,1:PRINT "LOADING ";FT$(M);"."
4040 COLOR 2:OPEN FT$(M) FOR INPUT AS #1
4050 FOR W=1 TO 33*ML(M):INPUT#1,AS(W):NEXT W
4060 FOR W=1 TO 64:INPUT#1,EVS(W):NEXT W:GOTO 4110
4070 LOCATE 18,1:PRINT "SAVING ";FT$(M);"."
4080 COLOR 2:OPEN FT$(M) FOR OUTPUT AS #1
4090 FOR W=1 TO 33*ML(M):WRITE#1,AS(W):NEXT W
4100 FOR W=1 TO 64:WRITE#1,EVS(W):NEXT W
4110 CLOSE#1:ON ERROR GOTO 0:GOSUB 2300:RETURN
4120 CLOSE#1:EC=ERR:EL=ERL:BEEP:RESUME 4130
4130 ON ERROR GOTO 0:GOSUB 2100:GOTO 4010
5000 EX=LEN(TS):COLOR 15,1:LOCATE WY,WX:PRINT TS;
5010 COLOR 1:PRINT SPACES(FL-EX):COLOR 15
5020 IF EX=FL THEN 5050
5030 LOCATE WY,WX+EX:PRINT CHRS(95)
5040 LOCATE WY,WX+EX:PRINT SP$
5050 K$=INKEY$:IF K$="" THEN 5020
5060 IF K$=CHRS(26) THEN TS="" : GOTO 5000
5070 IF K$=CHRS(8) THEN 5120
5080 IF LEN(K$)=2 OR K$<SP$ THEN 5140
5090 IF EX=FL THEN BEEP:GOTO 5050
5100 TS=TS+K$:LOCATE WY,WX+EX:PRINT K$
5110 EX=EX+1:GOTO 5020
5120 IF EX=0 THEN BEEP:GOTO 5050
5130 TS=MID$(TS,1,EX-1):GOTO 5000
5140 COLOR 7,0:IF K$=CHRS(13) THEN K$=CHRS(0)+"P"
5150 LOCATE WY,WX:PRINT TS;SPACES(FL-LEN(TS))
5160 COLOR 2:RETURN

```

SOLUTION TO LAST MONTH'S PUZZLE

A	N	G	E	L		L		S	N	O	W
A	O	R	T	A		S	A	T	I	K	E
P	R	I	O	R		R	S	T	U		O
	I	N	N	K	E	E	P	E	R		C
			E	N	T	R	E	E		K	
C	P	A	E	D		R	E	L	A	T	I
O	A	S				O	E	T	E	N	A
S	P	I	R	E	D			E	G	G	N
E	U	G	E	N	E		A	N		N	L
C	A	N	D	Y	C	A	N	E		E	L
		N				E	D	I	S	O	N
H	A	L	O			M	I	S	T	L	E
A	L	A	S			B	E	E	S		R
L	O	V	E			E	U			G	L
L	E	A	D			R				Y	U



Apple II & compatibles, Commodore 64/128, IBM & compatibles.

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Presenting the Street Sports™ Series from Epyx. In *Street Sports Basketball*, you'll shoot hoops in dingy alleys. Playgrounds. Parking lots. Occasionally, even the

toughest players in the neighborhood. There's hot shooters and slow dribblers. Team players and show-offs. There's guys who can shoot the eye



Sometimes it's best to take a pass.

score—well, maybe it's time to take up bridge.

Introducing *Street Sports Baseball*.

It's not going to be as simple as you thought to be the

TASTE THE THRILL OF VICTORY AND THE AGONY OF THE STREET.

suburbs (have fun dribbling on the lawn).

You'll pick your three-person team from the 10

out of a needle at 20 feet. And guys who couldn't sink one if they were sitting on the backboard. Pass on the run. Get that big man on the inside. Let Joey pop 'em from the corners. This is a real street strategy. Take a hook shot. A tip-in.

Bounce the ball off the chain-link fence, then go for the basket. Or power through a slam dunk.

But don't dribble in the oil slick. And for heavens sake, watch out for windows.

It's not like any basketball game you've ever played on a computer. But just like every basketball game you've ever played for real.

ANOTHER HIT. It's bottom of the ninth. Batter's 0 and 2. The

first on your block.

After all, you'll have to cope with makeshift diamonds, bases made from spare tires and trashcans, bushes, rocks, even squealing cars.

Not to mention 16 neighborhood players. Each with their own personalities and skills in pitching, hitting and fielding. With the right combination, you could be the champs. With the wrong combination, the chumps.

You'll pick the place. The team. The positions. The strategy. And then, you'll be right in the middle of it all. With a split-screen view from above and up close.

It won't be easy. But it's right up your alley.

Apple II & compatibles, Commodore 64/128, IBM & compatibles.

EPYX



Notice that somebody just stole second base. Funny, it was here a minute ago.

THE STREET SPORTS SERIES

BUZZ

BY JEFF D. DONAHUE



I don't think anyone knows how the game Buzz originated. It really doesn't matter. The fact remains that Buzz is a simple, yet challenging, game that seems to have been around forever.

In our two-player version of this game, player one uses the "Z" key to buzz, and player two uses the "/" (slash) key with CAPS LOCK on. (A single player should use the SPACE BAR.) Players choose a buzz number from three to nine (five is the easiest). The game then begins on player one's turn. The computer will start counting, beginning at one. If the number on the screen is a multiple of the buzz number, or if the buzz number appears within the displayed number, player one should press the "Z" key. As soon as the first number has been "buzzed," it becomes player two's turn.

For example, if the buzz number is three, instead of three, say "buzz." (Three is a multiple of three.)

Instead of six, say "buzz." (Six is a

multiple, also.)

Instead of nine, say "buzz." (Again, a multiple.)

Instead of twelve, say "buzz." (Yet again.)

Instead of thirteen, say "buzz." (Three appears in the number 13.)

Got the idea? The sequence would be 1, 2, "buzz," 4, 5, "buzz," 7, 8, "buzz," 10, 11, "buzz," "buzz," 14, "buzz," and so on.

Turns alternate between the two players until someone buzzes on a wrong number or forgets to buzz on a right number.

If your timing and math are both correct, when you buzz a number your score will go up and the computer will continue counting. The faster you buzz, the more points you score. Hint: Watch out for the really tough spots. For example, if the buzz number is five, you must buzz on 50, 51, 52, and so on.

Good luck! And be careful. If someone asks you what time it is, you may find yourself saying, "Oh, it's a quarter past 'buzz.'"

Apple II series/Buzz

```
10 DIM PS(2):SP$ = CHR$(32)
20 FOR P = 2 TO 6:SP$ = SP$+CHR$(32):NEXT P
30 PS(1) = "":PS(2) = "":TP = 0:PH = 0
40 HS = 0:N = 1:P = 1:S1 = 0:S2 = 0
50 HOME:S = -16336:VTAB 3:HTAB 4:FLASH
60 PRINT "BUZZ":NORMAL:PRINT "--THE NUMBER CHALLENGE"
70 VTAB 9:HTAB 4:PRINT "1 OR 2 PLAYERS? ->";
80 GOSUB 1000
90 IF XS < "1" OR XS > "2" THEN PRINT CHR$(7):GOTO 70
100 VTAB 11:GOSUB 2000
110 IF XS = "2" THEN TP = 1:P = 2:GOSUB 2000
```

```
120 HTAB 4
130 PRINT "PLEASE ENTER A NUMBER (3-9) ->";GOSUB 1000
140 IF XS < "3" OR XS > "9" THEN PRINT CHR$(7):GOTO 120
150 BN$ = XS:BN = VAL(XS)
160 HOME:PRINT PS(1);TAB(31);PS(2):PRINT
170 PRINT "SCORE: ";S1;
180 IF TP THEN HTAB 31:PRINT "SCORE: ";S2
190 INVERSE:VTAB 1:HTAB 14:PRINT "HIGH SCORE "
200 HTAB 14:PRINT SP$:SP$
210 FOR L = 10 TO 12
220 VTAB L:HTAB 17:PRINT SP$:NEXT L:VTAB 2
230 HTAB 19:PRINT HS:NORMAL:P = PH:GOSUB 3000:P = 1
240 VTAB 7:C$ = PS(P):GOSUB 4000
250 VTAB 11:HTAB 19:INVERSE:PRINT N:NORMAL
260 NS = STR$(N):BZ = PEEK(S)+PEEK(S)
270 VTAB 7:C$ = PS(P):GOSUB 4000
280 PK = 0:FOR L = 1 TO LEN(NS)
290 IF MID$(NS,L,1) = BN$ THEN PK = 1:L = LEN(NS)
300 NEXT L:IF INT(N/BN) = N/BN THEN PK = 1
310 SX = 0:FOR L = 1 TO 30:KB = PEEK(-16384)
320 IF KB < 128 THEN 350
330 IF (TP AND P = 1 AND KB = 218) OR (P = 2 AND KB = 175) OR (NOT TP AND KB = 160) THEN SX = 31-L:L = 30
340 POKE -16368,0
350 NEXT L:IF SX > 0 THEN 380
360 IF PK THEN 500
370 N = N+1:GOTO 250
380 FOR J = 1 TO 40:BZ = PEEK(S)+PEEK(S):NEXT J
390 IF NOT PK THEN 500
400 IF P = 2 THEN 440
410 S1 = S1+SX+BN:IF S1 > 999 THEN S1 = 999
420 VTAB 3:HTAB 8:PRINT S1:IF S1 <= HS THEN 490
430 HS = S1:HP = P:PH = 1:GOSUB 3000:GOTO 480
440 S2 = S2+SX+BN:IF S2 > 999 THEN S2 = 999
450 VTAB 3:HTAB 38:PRINT S2:IF S2 <= HS THEN 490
470 HS = S2:HP = P:PH = 2:GOSUB 3000
480 VTAB 2:HTAB 19:INVERSE:PRINT HS:NORMAL
490 PK = 0:N = N+1:P = P*TP+(P = 1)-(P = 2):GOTO 240
500 IF PS(P) = "" THEN CS = "YOU MISSED.":GOTO 520
510 CS = "YOU MISSED, "+PS(P)+"."
520 VTAB 15:GOSUB 4000
530 VTAB 18:HTAB 9:PRINT "PRESS <P> TO PLAY AGAIN"
540 VTAB 19:HTAB 12:PRINT "OR <Q> TO QUIT ...";
550 GOSUB 1000:IF XS <> "P" AND XS <> "Q" THEN 540
560 IF XS = "Q" THEN HOME:END
570 VTAB 24:HTAB 13:PRINT "SAME PLAYERS? ";
580 GOSUB 1000:IF XS = "N" THEN 30
590 P = 1:N = 1:S1 = 0:S2 = 0:HOME:GOTO 120
1000 GET XS:PRINT XS:L = ASC(XS)
1010 XS = CHR$(L-32*(L > 96)*(L < 123)):RETURN
2000 HTAB 4:PRINT "PLAYER ";P;
2010 INPUT "WHAT IS YOUR NAME? ";PL$
2020 PS(P) = LEFT$(PL$,8):PRINT:RETURN
3000 VTAB 1:HTAB 10+(P = 1)*18:PRINT LEFT$(SP$,3)
3010 VTAB 1:HTAB 10+(P = 2)*18
3020 IF PH = 1 THEN PRINT "<-":RETURN
3030 IF PH = 2 THEN PRINT "->"
3040 RETURN
4000 HTAB 14-LEN(CS)/2:PRINT SP$:CS:SP$:RETURN
```

Atari 800/XL/XE/Buzz

```
10 DIM PL(2),BN$(3),CS(21),NS(3),PS(16)
20 DIM PL$(8),S$(6),SP$(6),XS(3)
30 GRAPHICS 0:POKE 82,0:POKE 752,1
40 S$(1)=CHR$(32):S$(6)=CHR$(32):S$(2)=S$
50 SP$(1)=CHR$(160):SP$(6)=CHR$(160):SP$(2)=SP$
60 PL(2)=0:TP=0:PH=0
70 HS=0:N=1:P=1:S1=0:S2=0
80 PRINT CHR$(125):POSITION 3,2
90 PRINT "BUZZ--THE NUMBER CHALLENGE"
100 POSITION 3,8:PRINT "1 OR 2 PLAYERS? ->";
110 GOSUB 1000:IF XS<"1" OR XS>"2" THEN 100
120 POSITION 3,10:GOSUB 2000
130 IF XS="2" THEN TP=1:P=2:POSITION 3,12:GOSUB 2000
```


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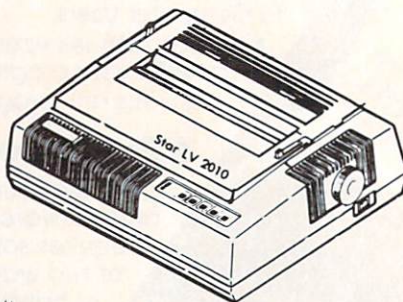
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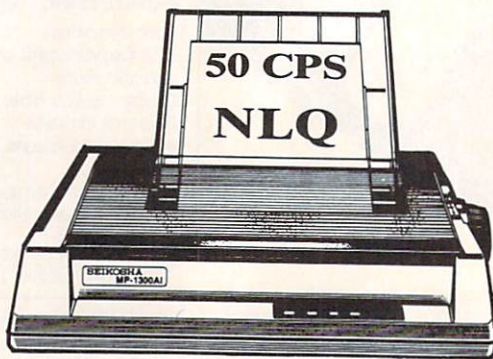
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FUN-AND-GAMES PROGRAM

```

140 POSITION 3,14
150 PRINT "PLEASE ENTER A NUMBER (3-9) ->";
160 GOSUB 1000:IF X$<"3" OR X$>"9" THEN 140
170 BN$=X$:BN=VAL(X$)
180 PRINT CHR$(125);P$(1,PL(1))
190 IF PL(2)<>0 THEN POSITION 29,0:PRINT P$(9,8+PL(2))
200 POSITION 0,2:PRINT "SCORE: ";S1;
210 IF TP THEN POSITION 29,2:PRINT "SCORE: ";S2
220 POSITION 14,0:PRINT "HIGH SCORE"
230 FOR L=9 TO 11:POSITION 16,L:PRINT SP$:NEXT L
240 POSITION 18,1:PRINT HS:P=PH:GOSUB 3000:P=1
250 T=P*8-7:POSITION 13-PL(P)/2,5
260 PRINT S$;P$(T,T-1+PL(P));S$
270 N$=STR$(N):POSITION 18,10:PRINT N
280 T=P*8-7:POSITION 13-PL(P)/2,5
290 PRINT S$;P$(T,T-1+PL(P));S$
300 PK=0:FOR L=1 TO LEN(N$)
310 IF N$(L,L)=BN$ THEN PK=1:L=LEN(N$)
320 NEXT L:IF INT(N/BN)=N/BN THEN PK=1
330 SX=0:FOR D=1 TO 30:KB=PEEK(764):IF KB=255 THEN 360
340 IF (TP AND P=1 AND KB=23) OR (P=2 AND KB=38) OR (
NOT TP AND KB=33) THEN SX=31-D:D=30
350 POKE 764,255
360 NEXT D:IF SX>0 THEN 390
370 IF PK THEN 500
380 N=N+1:GOTO 270
390 SOUND 0,200,10,15:FOR S=1 TO 40:NEXT S
400 SOUND 0,0,0,0:IF NOT PK THEN 500
410 IF P=2 THEN 450
420 S1=S1+SX+BN:IF S1>999 THEN S1=999
430 POSITION 7,2:PRINT S1:IF S1<=HS THEN 490
440 HS=S1:HP=P:PH=1:GOSUB 3000:GOTO 480
450 S2=S2+SX+BN:IF S2>999 THEN S2=999
460 POSITION 36,2:PRINT S2:IF S2<=HS THEN 490
470 HS=S2:HP=P:PH=2:GOSUB 3000
480 POSITION 18,1:PRINT HS
490 PK=0:N=N+1:P=P*TP+(P=1)-(P=2):GOTO 250
500 T=P*8-7:POSITION 12-PL(P)/2,14
510 PRINT "YOU MISSED, ";P$(T,T-1+PL(P));"."
520 POSITION 8,17:PRINT "PRESS <P> TO PLAY AGAIN"
530 POSITION 11,18:PRINT "OR <Q> TO QUIT ...";
540 GOSUB 1000:IF X$<"P" AND X$>"Q" THEN 530
550 IF X$="Q" THEN PRINT CHR$(125):POKE 752,0:END
560 POSITION 12,22:PRINT "SAME PLAYERS? ";
570 GOSUB 1000:IF X$="N" THEN 60
580 P=1:N=1:S1=0:S2=0:PRINT CHR$(125):GOTO 140
1000 OPEN #1,4,0,"K":GET #1,X
1010 X$=CHR$(X-(X>96)*(X<123)*32):CLOSE #1
1020 PRINT X$:RETURN
2000 PRINT "PLAYER ";P;," WHAT IS YOUR NAME";
2010 PL$="":POKE 752,0:INPUT PL$:POKE 752,1
2020 IF PL$="" THEN 2010
2030 PL(P)=LEN(PL$):P$(P*8-7,P*8)=PL$:RETURN
3000 POSITION 10+(P=1)*16,0:PRINT S$(1,2)
3010 POSITION 10+(P=2)*16,0
3020 IF PH=1 THEN PRINT "<":RETURN
3030 IF PH=2 THEN PRINT ">:"
3040 RETURN

```

Commodore 64 & 128 (C 64 mode)/Buzz

```

10 DIM P$(2)
20 SI=54272:FOR L=0 TO 23:POKE SI+L,0:NEXT L
30 POKE SI+5,36:POKE SI+6,128:POKE SI+12,36
40 POKE SI+13,68:POKE SI+24,15:RV$=CHR$(18)
50 SP$=RV$:FOR P=1 TO 6:SP$=SP$+CHR$(32):NEXT P
60 S$=CHR$(32):FOR P=2 TO 4:S$=S$+CHR$(32):NEXT P
70 P$(1)="" :P$(2)="" :TP=0:PH=0
80 HS=0:N=1:P=1:S1=0:S2=0
90 PRINT CHR$(147);POKE 214,1:PRINT
100 PRINT TAB(3);"BUZZ--THE NUMBER CHALLENGE"
110 RO=8:CO=3:GOSUB 5000:PRINT "1 OR 2 PLAYERS? -> ";
120 GOSUB 1000:IF X$<"1" OR X$>"2" THEN 110
130 PRINT:GOSUB 2000
140 IF X$="2" THEN P=-1:P=2:GOSUB 2000
150 PRINT TAB(3);"PLEASE ENTER A NUMBER (3-9) ->";

```

```

160 GOSUB 1000:IF X$<"3" OR X$>"9" THEN 150
170 BN$=X$:BN=VAL(X$)
180 PRINT CHR$(147);P$(1);TAB(30);P$(2):PRINT
190 PRINT "SCORE: ";STR$(S1);
200 IF TP THEN PRINT TAB(30);"SCORE: ";STR$(S2)
210 RO=0:CO=13:GOSUB 5000
220 PRINT CHR$(18);" HIGH SCORE "
230 RO=1:CO=13:GOSUB 5000:PRINT SP$:SP$
240 FOR L=9 TO 11
250 RO=L:CO=16:GOSUB 5000:PRINT SP$:NEXT L
260 RO=1:CO=17:GOSUB 5000
270 PRINT RV$;STR$(HS):P=PH:GOSUB 3000:P=1
280 RO=6:CO=0:GOSUB 5000:C$=P$(P):GOSUB 4000
290 RO=10:CO=17:GOSUB 5000
300 N$=STR$(N):PRINT RV$;N$
310 RO=6:CO=0:GOSUB 5000:C$=P$(P):GOSUB 4000
320 PK=0:FOR L=1 TO LEN(N$)
330 IF MID$(N$,L,1)=BN$ THEN PK=-1:L=LEN(N$)
340 NEXT L:IF INT(N/BN)=N/BN THEN PK=-1
350 SX=0:FOR L=1 TO 60:GET KB$:IF KB$="" THEN 390
360 KB=ASC(KB$)
370 IF (TP AND P=1 AND KB=90) OR (P=2 AND KB=47) OR (NOT
TP AND KB=32) THEN PF=-1
380 IF PF THEN SX=31-INT(L/2):L=60
390 NEXT L:IF SX>0 THEN 420
400 IF PK THEN 570
410 N=N+1:GOTO 290
420 POKE SI+4,33:POKE SI+11,33:POKE SI,144
430 POKE SI+1,16:POKE SI+7,134:POKE SI+8,16
440 FOR D=1 TO 20:NEXT D:POKE SI+11,32:POKE SI+4,32
450 IF NOT PK THEN 570
460 IF P=2 THEN 510
470 S1=S1+SX+BN:IF S1>999 THEN S1=999
480 RO=2:CO=6:GOSUB 5000:PRINT STR$(S1)
490 IF S1<=HS THEN 560
500 HS=S1:HP=P:PH=1:GOSUB 3000:GOTO 550
510 S2=S2+SX+BN:IF S2>999 THEN S2=999
520 IF TP THEN RO=2:CO=36:GOSUB 5000:PRINT STR$(S2)
530 IF S2<=HS THEN 560
540 HS=S2:HP=P:PH=2:GOSUB 3000
550 RO=1:CO=17:GOSUB 5000:PRINT CHR$(18)+STR$(HS)
560 PK=0:N=N+1:P=-P*TP-(P=1)+(P=2):GOTO 280
570 IF P$(P)="" THEN C$="YOU MISSED.":GOTO 590
580 C$="YOU MISSED, "+P$(P)+"."
590 RO=14:CO=0:GOSUB 5000:GOSUB 4000
600 RO=17:CO=8:GOSUB 5000
610 PRINT "PRESS <P> TO PLAY AGAIN"
620 RO=18:CO=11:GOSUB 5000:PRINT "OR <Q> TO QUIT ...";
630 GOSUB 1000:IF X$<"P" AND X$>"Q" THEN 620
640 IF X$="Q" THEN PRINT CHR$(147);:END
650 RO=23:CO=13:GOSUB 5000:PRINT "SAME PLAYERS? ";
660 GOSUB 1000:IF X$="N" THEN 70
670 P=1:N=1:S1=0:S2=0:PRINT CHR$(147);:GOTO 150
1000 GET X$:IF X$="" THEN 1000
1010 PRINT X$:L=ASC(X$)
1020 X$=CHR$(L-32*(L>96)*(L<123)):RETURN
2000 PRINT TAB(3);"PLAYER";STR$(P);
2010 INPUT " WHAT IS YOUR NAME";PL$
2020 P$(P)=LEFT$(PL$,8):PRINT:RETURN
3000 RO=0:CO=10-(P=1)*16:GOSUB 5000:PRINT LEFT$(S$,2)
3010 RO=0:CO=10-(P=2)*16:GOSUB 5000
3020 IF PH=1 THEN PRINT "<":RETURN
3030 IF PH=2 THEN PRINT ">:"
3040 RETURN
4000 PRINT TAB(15-LEN(C$)/2);S$;C$;S$:RETURN
5000 POKE 783,0:POKE 781,RO:POKE 782,CO
5010 SYS 65520:RETURN

```

IBM PC & compatibles/Buzz

```

10 DIM P$(2):KEY OFF:LOCATE ,,0
20 SP$=SPACES(6)
30 P$(1)="" :P$(2)="" :TP=0:PH=0:HS=0:N=1:P=1:S1=0:S2=0
40 CLS:COLOR 0,7:LOCATE 3,4:PRINT "BUZZ";
50 COLOR 7,0:PRINT"--The Number Challenge"
60 LOCATE 9,4:PRINT"1 or 2 players? ";:GOSUB 1000

```


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FUN-AND-GAMES PROGRAM

```

70 IF X$<"1" OR X$>"2" THEN SOUND 1000,6:GOTO 60
80 LOCATE 11,1:GOSUB 2000
90 IF X$="2" THEN TP=-1:P=2:GOSUB 2000:P=1
100 PRINT TAB(4);"Please enter a number (3-9) ->";
110 GOSUB 1000
120 IF X$<"3" OR X$>"9" THEN SOUND 1000,6:GOTO 100
130 BNS=X$:BN=VAL(X$)
140 CLS:PRINT PS(1);TAB(30);PS(2):PRINT
150 PRINT "Score:";S1;
160 IF TP THEN PRINT TAB(30);"Score:";S2
170 COLOR 0,7:LOCATE 1,14:PRINT "High Score "
180 LOCATE 2,14:PRINT SPACES(12)
190 FOR L=10 TO 12:LOCATE L,17:PRINT SP$:NEXT L
200 LOCATE 2,18:PRINT HS:COLOR 7,0:P=PH:GOSUB 3000:P=1
210 LOCATE 7,1:C$=P$(P):GOSUB 4000
220 COLOR 0,7:LOCATE 11,18:PRINT N:COLOR 7,0
230 N$=STR$(N):SOUND 25000,3
240 C$=P$(P):LOCATE 7,1:GOSUB 4000
250 PK=0:FOR L=1 TO LEN(N$)
260 IF MID$(N$,L,1)=BNS THEN PK=-1:L=LEN(N$)
270 NEXT L:IF N MOD BN=0 THEN PK=-1
280 SX=0:FOR L=1 TO 60:KBS=INKEY$
290 IF KBS="" THEN 310 ELSE KB=ASC(KBS)
300 IF (TP AND P=1 AND KB=90) OR (P=2 AND KB=47) OR (N
OT TP AND KB=32) THEN SX=INT(31-(L/2)):L=60
310 NEXT L:IF SX>0 THEN 330
320 IF PK THEN 400 ELSE N=N+1:GOTO 220
330 SOUND 80,6:IF NOT PK THEN 430
340 IF P=2 THEN 380
350 S1=S1+SX+BN:IF S1>999 THEN S1=999
360 LOCATE 3,7:PRINT S1:IF S1<=HS THEN 420
370 HS=S1:HP=P:PH=1:GOSUB 3000:GOTO 410
380 S2=S2+SX+BN:IF S2>999 THEN S2=999
390 LOCATE 3,36:PRINT S2:IF S2<=HS THEN 420
400 HS=S2:HP=P:PH=2:GOSUB 3000
410 COLOR 0,7:LOCATE 2,18:PRINT HS:COLOR 7,0
420 PK=0:N=N+1:P=-P*TP-(P=1)+(P=2):GOTO 210
430 IF P$(P)="" THEN C$="You missed.":GOTO 450
440 C$="You missed, "+P$(P)+". "
450 LOCATE 15,1:GOSUB 4000
460 LOCATE 18,9:PRINT "Press <P> to play again"
470 LOCATE 19,12:PRINT "or <Q> to quit ...";
480 GOSUB 1000:IF X$<"P" AND X$>"Q" THEN 470
490 IF X$="Q" THEN CLS:LOCATE 1,1:KEY ON:END
500 LOCATE 24,14:PRINT "Same players? ";
510 GOSUB 1000:IF X$="N" THEN 30
520 P=1:N=1:S1=0:S2=0:CLS:GOTO 100
1000 X$=INKEY$:IF X$="" THEN 1000
1010 PRINT X$:L=ASC(X$)
1020 X$=CHR$(L-32*(L>96)*(L<123)):RETURN
2000 PRINT TAB(4);"Player";STR$(P);
2010 INPUT " , what is your name";PL$
2020 P$(P)=LEFT$(PL$,8):PRINT:RETURN
3000 LOCATE 1,11-(P=1)*16:PRINT SPACES(2)
3010 LOCATE 1,11-(P=2)*16
3020 IF PH=1 THEN PRINT "<-" :RETURN
3030 IF PH=2 THEN PRINT "->"
3040 RETURN
4000 PRINT TAB(14-LEN(C$)/2);SP$:C$:SP$:RETURN

```

Macintosh/Buzz

```

10 DIM PS(2):SP$=CHR$(32)+CHR$(32)
20 CALL TEXTFONT(4):CALL TEXTSIZE(9):CALL TEXTMODE(0)
30 WINDOW 1,"BUZZ--THE NUMBER CHALLENGE", (0,38)-(527,3
38)
40 PS(1)="" : PS(2)="" : TP=0:PH=0:HS=0:N=1:P=1:S1=0:S2=0
50 CLS:LOCATE 3,28:PRINT "1 or 2 players? ";
60 GOSUB 1000
70 IF X$<"1" OR X$>"2" THEN SOUND 1000,6:GOTO 50
80 LOCATE 8,21:GOSUB 2000
90 IF X$="2" THEN TP=-1:P=2:GOSUB 2000
100 PRINT TAB(28);"Please enter a number (3-9) ->";
110 GOSUB 1000
120 IF X$<"3" OR X$>"9" THEN SOUND 1000,6:GOTO 100
130 BNS=X$:BN=VAL(X$)

```

```

140 CLS:PRINT:PRINT PS(1);TAB(70);PS(2)
150 PRINT:PRINT "Score:";S1;
160 IF TP THEN PRINT TAB(70);"Score:";S2
170 LOCATE 2,35:PRINT "HIGH SCORE"
180 LOCATE 3,38:PRINT HS:P=PH:GOSUB 3000:P=1
190 LOCATE 8,21:C$=P$(P):GOSUB 4000
200 LOCATE 11,38:PRINT N:N$=STR$(N):SOUND 25000,3
210 LOCATE 8,21:C$=P$(P):GOSUB 4000
220 PK=0:FOR L=1 TO LEN(N$)
230 IF MID$(N$,L,1)=BNS THEN PK=-1:L=LEN(N$)
240 NEXT L:IF N MOD BN=0 THEN PK=-1
250 SX=0:FOR L=1 TO 90:KBS=INKEY$
260 IF KBS="" THEN 280 ELSE KB=ASC(KBS)
270 IF (TP AND P=1 AND KB=90) OR (P=2 AND KB=47) OR (N
OT TP AND KB=32) THEN SX=INT(31-(L/3)):L=90
280 NEXT L:IF SX>0 THEN 300
290 IF PK THEN 400 ELSE N=N+1:GOTO 200
300 SOUND 80,6:IF NOT PK THEN 400
310 IF P=2 THEN 350
320 S1=S1+SX+BN:IF S1>999 THEN S1=999
330 LOCATE 4,7:PRINT S1:IF S1<=HS THEN 390
340 HS=S1:HP=P:PH=1:GOSUB 3000:GOTO 380
350 S2=S2+SX+BN:IF S2>999 THEN S2=999
360 LOCATE 4,76:PRINT S2:IF S2<=HS THEN 390
370 HS=S2:HP=P:PH=2:GOSUB 3000
380 LOCATE 3,38:PRINT HS
390 PK=0:N=N+1:P=-P*TP-(P=1)+(P=2):GOTO 190
400 IF P$(P)="" THEN C$="You missed.":GOTO 420
410 C$="You missed, "+P$(P)+". "
420 LOCATE 15,21:GOSUB 4000
430 LOCATE 18,29:PRINT "Press <P> to play again"
440 LOCATE 19,32:PRINT "or <Q> to quit ...";
450 GOSUB 1000:IF X$<"P" AND X$>"Q" THEN 440
460 IF X$="Q" THEN CLS:END
470 LOCATE 24,34:PRINT "Same players? ";
480 GOSUB 1000:IF X$="N" THEN 40
490 P=1:N=1:S1=0:S2=0:CLS:GOTO 100
1000 X$=INKEY$:IF X$="" THEN 1000
1010 PRINT X$:L=ASC(X$)
1020 X$=CHR$(L-32*(L>96)*(L<123)):RETURN
2000 PRINT TAB(28);"Player";STR$(P);
2010 INPUT " , what is your name";PL$
2020 P$(P)=LEFT$(PL$,8):PRINT:RETURN
3000 LOCATE 2,27-(P=1)*24:PRINT SP$
3010 LOCATE 2,27-(P=2)*24
3020 IF PH=1 THEN PRINT "<-" :RETURN
3030 IF PH=2 THEN PRINT "->"
3040 RETURN
4000 PRINT TAB(36-LEN(C$)/2);SP$:C$:SP$:SP$:RETURN

```

Tandy Color Computer/Buzz

```

10 CLEAR 500:DIM PS(2)
20 SP$=STRING$(6,207):S$=STRING$(4,32)
30 PS(1)="" : PS(2)="" : TP=0:PH=0
40 HS=0:N=1:P=1:S1=0:S2=0:TB=0
50 CLS:PRINT@67,"BUZZ--THE NUMBER CHALLENGE"
60 PRINT@163,"1 OR 2 PLAYERS? ";:GOSUB 1000
70 IF X$<"1" OR X$>"2" THEN SOUND 255,6:GOTO 60
80 PRINT:GOSUB 2000:PRINT
90 IF X$="2" THEN TP=-1:P=2:GOSUB 2000:PRINT
100 PRINT TAB(3);"CHOOSE A NUMBER (3-9) -> ";
110 GOSUB 1000
120 IF X$<"3" OR X$>"9" THEN SOUND 255,6:GOTO 100
130 BNS=X$:BN=VAL(X$)
140 CLS:PRINT PS(1);TAB(22);PS(2);:PRINT
150 PRINT:PRINT "SCORE:";:TB=71:C$=STR$(S1):GOSUB 3000
160 IF TP THEN PRINT@86,"SCORE:";:TB=93:C$=STR$(S2):GOS
UB 3000
170 PRINT@43,"HIGH SCORE";
180 FOR L=205 TO 269 STEP 32:PRINT@L,SP$:NEXT L
190 TB=15:C$=STR$(HS):P=PH:GOSUB 3000:GOSUB 4000:P=1
200 TB=128:C$=P$(P):GOSUB 5000
210 N$=STR$(N):TB=239:C$=N$:GOSUB 3000:SOUND 255,3
220 TB=128:C$=P$(P):GOSUB 5000
230 PK=0:FOR L=1 TO LEN(N$)

```



```

240 IF MID$(N$,L,1)=BNS THEN PK=-1:L=LEN(N$)
250 NEXT L:IF INT(N$)/BN=N/BN THEN PK=-1
260 SX=0:FOR L=1 TO 30:KB$=INKEY$
270 IF KB$="" THEN 290 ELSE KB=ASC(KB$)
280 IF (TP AND P=1 AND KB=90) OR (P=2 AND KB=47) OR (NO
T TP AND KB=32) THEN SX=31-L:L=30
290 NEXT L:IF SX>0 THEN 310
300 IF PK THEN 410 ELSE N=N+1:GOTO 210
310 SOUND 80,6:IF NOT PK THEN 410
320 IF P=2 THEN 360
330 S1=S1+SX+BN:IF S1>999 THEN S1=999
340 TB=71:C$=STR$(S1):GOSUB 3000:IF S1<=HS THEN 400
350 HS=S1:HP=P:PH=1:GOSUB 4000:GOTO 390
360 S2=S2+SX+BN:IF S2>999 THEN S2=999
370 TB=93:C$=STR$(S2):GOSUB 3000:IF S2<=HS THEN 400
380 HS=S2:HP=P:PH=2:GOSUB 4000
390 TB=15:C$=STR$(HS):GOSUB 3000
400 PK=0:N=N+1:P=-P*TP-(P=1)+(P=2):GOTO 200
410 IF P$(P)="" THEN C$="YOU MISSED.":GOTO 430
420 C$="YOU MISSED, "+P$(P)+".
430 TB=320:GOSUB 5000
440 PRINT@389,"PRESS <P> TO PLAY AGAIN"
450 PRINT@424,"OR <Q> TO QUIT ...";
460 GOSUB 1000:IF X$<>"P" AND X$<>"Q" THEN 450
470 IF X$="Q" THEN CLS:END
480 PRINT@458,"SAME PLAYERS? ";
490 GOSUB 1000:IF X$="N" THEN 30
500 P=1:N=1:S1=0:S2=0:CLS:GOTO 100
1000 X$=INKEY$:IF X$="" THEN 1000
1010 PRINT X$:L=ASC(X$)
1020 X$=CHR$(L-32*(L>96)*(L<123)):RETURN
2000 PRINT TAB(3);"PLAYER";STR$(P);
2010 PRINT " , WHAT IS YOUR NAME"
2020 PRINT TAB(3);INPUT " ";PL$
2030 P$(P)=LEFT$(PL$,8):RETURN
3000 C$=MID$(C$,2):PRINT@TB,C$;:RETURN
4000 PRINT@11-(P=1)*8,CHR$(32)+CHR$(32);
4010 IF PH=1 THEN PRINT@11,"<-":RETURN
4020 IF PH=2 THEN PRINT@19,"->";
4030 RETURN
5000 PRINT@TB+12-LEN(C$)/2,SS;C$;SS:RETURN
    
```

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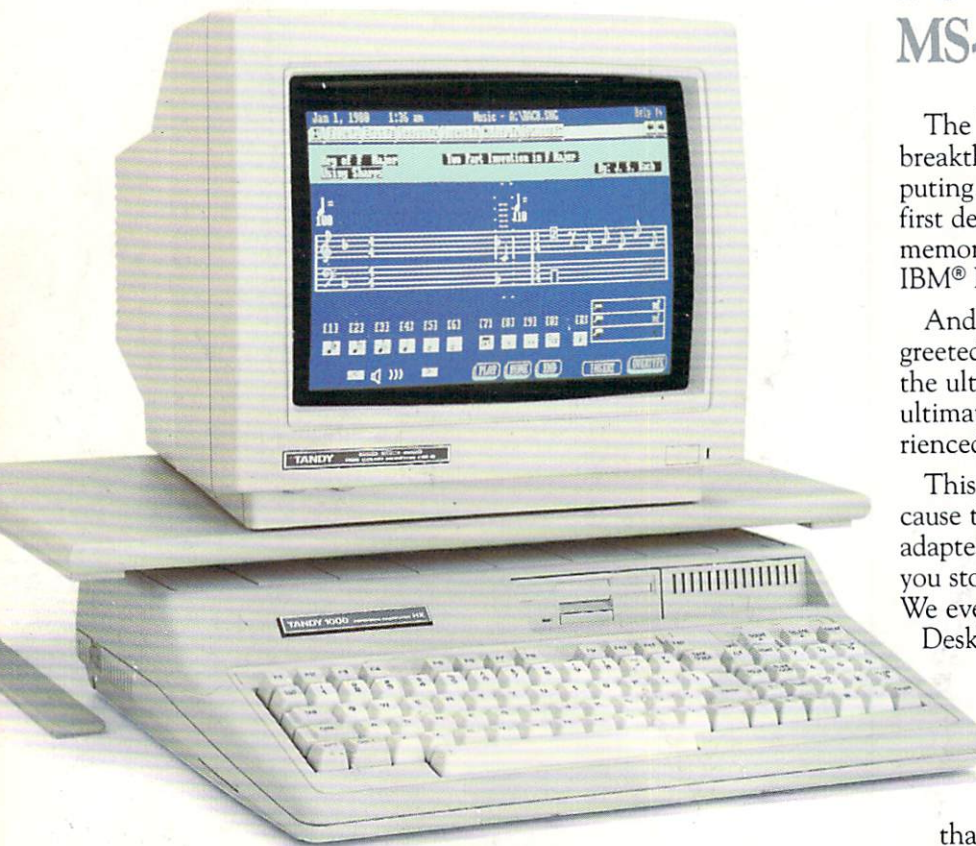
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